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**ILLINOIS
JOB COMPLETION REPORT
FOREST WILDLIFE INVESTIGATIONS**



**FEDERAL AID PROJECT NUMBER W-105-R(5)
PERIOD COVERED: JULY 1, 1993 - JUNE 30, 1994**

Prepared by: Jared Garver, Mike Gregonis, Marty Jones, John Kube
Forest Wildlife Project Managers

Paul Shelton, Forest Wildlife Program Manager
John Buhnerkempe, Forest and Grassland Wildlife Section Head
Jeffrey Ver Steeg, Wildlife Resources Division Chief
Brent Manning, Director, Department of Conservation

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1993 ILLINOIS DEER HARVEST REPORT

STUDY 1 - POPULATION STUDIES OF WHITE-TAILED DEER

STATE OF ILLINOIS NAME: FOREST WILDLIFE INVESTIGATIONS

PROJECT NO.: W-105-R (5) TITLE: POPULATION DATA FROM DEER HARVEST

JOB 1A and 1B

OBJECTIVE: (1A) To characterize the status of deer herds as to age/sex ratio and general condition by county, region and statewide from check station data. (1B) To specify annual hunter success and interpret the effects of hunting pressure on harvest and hunter success.

ABSTRACT:

Traditional Firearm Deer Season: The 1993 firearm season consisted of one 3-day weekend (November 19-21) and a second 4-day weekend (December 2-5). Harvest information collected at check stations located in the 98 counties open to firearm hunting identified a record harvest of 91,946 deer, which represents an increase of 8,147 (9%) over 1992. A total of 248,583 shotgun permits were issued, with a permit success rate of 37 percent (figured utilizing the total number of permits issued - not to be confused with hunter success which utilizes the number of unique hunters), an increase of 2 percent from 1992 (Appendix A). Tables 1, 2, 3 and 4 illustrate permits issued by type, deer harvest by region, age and sex composition of harvest, and age composition of the adult male cohort, respectively.

Table 1. ILLINOIS FIREARM DEER HARVEST BY PERMIT TYPE - 1993

<u>Permit Type</u>	<u>Permits Issued</u>	<u>Deer Harvested</u>	<u>Permit Success</u>	<u>% of Harvest</u>
Full Season E-S	134,051	52,102	39%	57%
Second Season E-S	14,193	2,663	19%	3%
Full Season A-O	34,594	16,859	49%	19%
Second Season A-O	1,310	371	28%	<1%
Free Landowner E-S	28,928	6,948	24%	8%
Free Landowner A-O	28,928	8,418	29%	9%
<u>Paid Landowner E-S</u>	<u>6,579</u>	<u>2,799</u>	<u>43%</u>	<u>5%</u>
State Totals	248,583	91,024*	37%	100%

* Total does not include deer killed at special hunt areas or an additional 650 deer from Calhoun County obtained through extrapolation.

An additional 160 deer were harvested and recorded with either a muzzleloading (122) or handgun permit (38). Holders of muzzleloading-only permits were allowed to hunt during the second weekend of the firearm season, but the handgun permits may have been used in error.

Table 2. ILLINOIS FIREARM DEER HARVEST BY REGION - 1993

<u>REGION</u>	<u>PERMITS</u>	<u>HARVEST</u>	<u>SUCCESS*</u>	<u>CHANGE IN SUCCESS RATE</u>
1	23,456	8,863	38%(30)	+8%
2	21,829	7,458	34%(29)	+5%
3	36,723	13,650	37%(34)	+3%
4	36,669	15,536**	42%(41)	+1%
5	9,861	3,302	34%(31)	+3%
6	20,994	7,945	38%(39)	-1%
7	57,696	20,183	35%(36)	+1%
<u>8</u>	<u>41,114</u>	<u>14,746</u>	<u>36%(36)</u>	<u>0</u>
State	248,342***	91,946	37%(35)	+2%

* Figures in parenthesis represent 1992 hunter success in percentages.

** Includes an additional 650 deer for Calhoun County obtained through extrapolation.

*** Discrepancy in permits issued between Table 1 and 2 reflect an apparent data entry deficiency. Permits issued as reflected in Table 1 are considered correct.

Table 3. SEX AND AGE COMPOSITION OF THE 1993 FIREARM DEER HARVEST

<u>AGE</u>	<u>MALES</u>	<u>% MALES</u>	<u>FEMALES</u>	<u>% FEMALES</u>	<u>TOTAL*</u>	<u>% TOTAL</u>
FAWN	15,051	.29%	12,281	.30%	27,332	.30%
1½	19,162	.37%	13,081	.32%	32,243	.35%
2½	10,992	.21%	10,066	.25%	21,058	.23%
3½	4,857	.10%	3,684	.09%	8,541	.09%

4½	1,067	.02%	925	.02%	1,992	.02%
<u>4½+</u>	<u>265</u>	<u><.01%</u>	<u>366</u>	<u>.01%</u>	<u>631</u>	<u>.01%</u>
TOTAL	51,394	56%	40,403	44%	91,797	100%

* Does not include deer harvested with no age or sex recorded.

Table 4. AGE COMPOSITION OF 1993 MALE COHORT HARVEST AGED AS YEARLINGS OR OLDER

<u>AGE</u>	<u>TOTAL</u>	<u>PERCENT of Total*</u>
1½	19,162	53% (53%)
2½	10,992	30% (30%)
3½	4,857	13% (13%)
4½	1,067	3% (2%)
<u>4½+</u>	<u>265</u>	<u>1% (1%)</u>
TOTAL	36,343	100%

* Figures in parenthesis represent 1992 percentages.

Muzzleloading Deer Season: During December 10-12, 1993, the Department of Conservation provided for the third annual statewide 3-day Muzzleloading Deer Season (Cook, DuPage, Kane and Lake Counties are closed to firearm deer hunting). Individuals interested in hunting this distinct and separate season were eligible to apply for an either-sex and antlerless-only muzzleloading permit and could not apply for a regular shotgun permit until after the initial lottery and first random daily drawings. There was a total of 3,017 either-sex and 349 antlerless-only permits issued for the 1993 muzzleloading season. A total of 458 deer were harvested during the muzzleloading-only season (with an additional 194 deer harvested during the second season of the traditional firearm season). Seventy-one percent of the total kill were taken by hunters with muzzleloading-only permits, with the remaining 29 percent harvested by individuals utilizing unfilled free landowner, regular firearm or archery permits (the latter two being illegal during the muzzleloading season). Of the 458 deer harvested during the Muzzleloading-Only season, 198 (43%) were male and 259 (57%) were female, with the

permits (the latter two being illegal during the muzzleloading season). Of the 454 deer harvested during the Muzzleloading-only season, 198 (44%) were male and 255 (56%) were female (Appendix B). Overall permit success was not computed because it is impossible to determine how many muzzleloading permit holders hunted during the regular firearm season or how many unsuccessful landowner permit holders utilized their unfilled permits to hunt during the muzzleloading season. However, there were 63 deer harvested by individuals utilizing their unfilled either-sex permits; 68 deer were taken by individuals using an unfilled antlerless-only free landowner permit; 2 deer were taken by individuals using an either-sex firearm permit; and 2 deer were harvested by individuals using archery permits. The latter 2 permit types were illegal to use during the muzzleloading-only season.

Table 5. 1993 MUZZLELOADING HARVEST RESULTS BY PERMIT TYPE

<u>Permit Type</u>	<u>Male</u>	<u>Female</u>	<u>Harvest</u>	<u>Percent of Total Harvest</u>
E-S Muzzleloading Permit	141	139	281*	61% (51%)**
A-O Muzzleloading Permit	5	37	42	9% (8%)
E-S Free Landowner Permit	36	27	63	14% (20%)
A-O Free Landowner Permit	13	55	68	15% (19%)
E-S Firearm***	1	1	2	<1% (<1%)
Free Archery Landowner***	1	0	1	<1% (<1%)
<u>Archery 2nd Permit</u>	<u>1</u>	<u>0</u>	<u>1</u>	<u><1% (0%)</u>

State Totals 198 259 458* 99% (99%)

* Includes 1 deer with no sex recorded.

** Figures in parenthesis represent 1992 percentages.

*** Illegally tagged deer.

E-S = Either-sex

A-O = Antlerless-only

Handgun Deer Season - Special January Season: A 3-day handgun season was held during January (14, 15 and 16) 1994 in 20 counties in Illinois. Counties opened for the first time during January 1994 for handgun deer hunting were Brown, Fulton, Jefferson, McLean and Randolph. Definition of a legal handgun and its use consists of the following:

- (1) automatic and semi-automatic handguns are illegal;
- (2) minimum barrel length is 4 inches; and
- (3) the only legal handgun cartridge must be centerfire and .30 caliber or larger with a factory load available that, according to published ballistic tables of the manufacturer, produces at least 500

foot pounds of energy at the muzzle and whose case length does not exceed 1.4 inches. According to these parameters, legal handguns include but are not necessarily limited to the following: .30 caliber carbine, .357 magnum, 10mm, .41 magnum, .44 magnum, .45 Winchester magnum and the .454 Casull.

Counties perceived by landowners as having excessive deer numbers and having historical hunter success that exceeded 40 percent were selected for the January 1994 hunting season. A total of 9,308 antlerless-only permits were issued through a randomized lottery drawing. There were 5,415 permits remaining for all counties at the close of the allocation period. 1,006 antlerless deer were taken, with 11 percent hunter success. This is a decrease of 4 percent from the 1993 season. In Central Illinois weather conditions were very unfavorable for hunting with temperatures ranging between 10 and 15 degrees below zero. Of the 1,006 deer harvested, 25 percent (245) were antlerless males and the remaining 75 percent (745) were females (Table 6).

Table 6. HANDGUN HARVEST RESULTS - JANUARY 1994

<u>County</u>	<u>Permits Issued</u>	<u>Total Harvest</u>	<u>Hunter Success</u>	<u>Antlerless Males</u>	<u>Antlerless Females</u>
Adams	549 (1000)*	65	13% (15%)	15	45
Brown	236 (1000)	34	14% (0%)	10	24
Calhoun	201 (400)	15	7% (16%)	2	13
Crawford	337 (500)	37	11% (17%)	10	26
Fulton	536 (1000)	42	8% (0%)	9	33
Greene	355 (500)	17	5% (14%)	5	12
Grundy	249 (250)	19	8% (12%)	0	19
Jasper	468 (500)	66	14% (18%)	20	45
Jefferson	263 (1000)	23	10% (0%)	5	16
JoDaviess	902 (1000)	102	11% (13%)	32	70
Johnson	1073 (1073)	116	11% (14%)	29	85
Lawrence	166 (250)	17	10% (14%)	3	14
McLean	310 (500)	33	11% (0%)	15	18
Ogle	562 (1000)	73	14% (13%)	12	58
Perry	547 (1000)	62	11% (14%)	14	48
Pike	772 (!000)	138	18% (24%)	29	109
Randolph	379 (1000)	20	5% (0%)	2	18
Union	712 (1000)	48	7% (10%)	11	36
Wayne	500 (500)	65	13% (17%)	18	46
<u>Whiteside</u>	<u>191 (250)</u>	<u>14</u>	<u>7% (17%)</u>	<u>4</u>	<u>10</u>
Total	9308 (14723)	1006**	11% (15%)	245 (25%)	745 (75%)

* Figures in parenthesis represent county quotas.

** Total harvest includes 16 unsexed deer.

Archery Deer Season: In counties closed to firearm deer hunting, the 1993-94 archery season consisted of 105 days between 1 October and 13 January. In counties open to firearm deer hunting, the season length consisted of 98 days. Archery hunting hours were from sunset to one-half hour after sunset. Archery deer hunting is not allowed during the traditional firearm deer season in counties open to firearm deer hunting. However, archers were allowed to hunt during the muzzleloading season but were required to wear 400 square inches of blaze orange. There were 81,000 unique archers within the state of whom 34,198 desired an additional either-sex permit; 12,776 individuals elected to purchase an additional antlerless-only permit; and 11,830 free landowner permits were issued (consisting of one either-sex plus one additional antlerless-only permit per landowner for a total of 23,660 individual free landowner permits), for a total of 151,634 archery permits allocated (an increase of 4 percent over 1992). In addition to resident archery permits, there were 2,094 nonresident permits issued. Archers were required to check their deer in at an archery check station within 48 hours of harvest. Archery harvest results showed an estimated 23,214 deer taken, resulting in a permit success of 15 percent (Appendix C).

TECHNIQUES:

It is mandatory that all successful hunters register their deer at one of the check stations established in each county that allows firearm hunting (98 of 102 counties in Illinois), archery hunting (legal in all 102 counties) and handgun hunting (legal in 20 of 102 counties). Each hunter receives a list of all check station locations within the state. Hunters are no further than 25 miles from a check station location and are allowed to use the check station nearest the kill site. Data on sex, age and county of kill is recorded for all deer taken by firearm, along with information on wild turkey sightings and other pertinent data. Data is taken from all kill sheets, entered into a computer file and results tabulated on state computers.

RECOMMENDATIONS:

It is recommended that harvest data be collected in the same manner during the 1994 season(s). Additionally, universities or colleges should be contacted for hiring and training check station operators as well as coordinating the distribution and collection of check station harvest data. Check station operations should continue using voluntary proprietorships throughout the state to record the deer harvest. Division of Law Enforcement (CPO's) should be

responsible for distributing archery check station materials. Division of Wildlife Resources (District Wildlife Biologists/Private Land Biologists) should be responsible for picking up archery and handgun harvest sheets within two weeks after the close of the season(s). Because districts vary in size, the time commitment to accomplish this objective would vary. However, because most check stations could be contacted during the normal weekly routine of DWM's and PLB's, the time commitment should not exceed one day per individual. Archery harvest reports need to be completed in a more timely fashion. Therefore, it is recommended that entry of archery harvest data become the responsibility of our Electrical Data Processing (EDP) Section or be bid out to a private vendor as is done with the firearm harvest records. Due to the gradual erosion of compliance from successful firearm deer hunters in checking their deer into the nearest county check station, the Division of Law Enforcement needs to encourage its Conservation Police Officers (CPO's) to actively enforce the "county of kill or nearest check station" regulation (archers are required to check their deer in but not necessarily at the check station closest to the kill site). If the current trend continues to "forgive" hunters traveling a number of counties before checking in their deer, can it be far behind that hunters will begin believing that this law is not being enforced and therefore they will discontinue checking in their deer at all? With the enthusiastic public support and the desire for additional open counties, the Department needs to expand the number of counties open to handgun deer hunting. Currently, the Illinois deer herd would not be jeopardized by adding counties experiencing high hunter success and landowner concerns to the handgun season. Attention needs to be given to revising the Wildlife Code to allow for the use of handguns other than in a "special hunt" situation. The muzzleloading season should be continued for two more years under its current structure to provide the opportunity to evaluate participation and approval (disapproval) of the constituencies. After this evaluation period, should it be decided to terminate the muzzleloading season, it is recommended that consideration be given to consolidating the muzzleloading and handgun seasons. It is recommended we discontinue the current policy of allowing free landowner permit holders to hunt the muzzleloading-only season on their own property. Rationale for this recommendation is that there is absolutely no method of ascertaining how many landowners are taking advantage of this policy, making it impossible to determine accurate harvest statistics for the muzzleloading season. However, if the Department continues the current policy of allowing individuals possessing unfilled free landowner permits to hunt during the muzzleloading only season, it is recommended that these permits be converted to antlerless-only permits. Justification for this recommendation would be to allow landowners the opportunity to manage their own deer densities for the purpose of alleviating deer

depredation. Revisions are needed in tabulating data for computer reports now being generated, e.g., there is a need for a report identifying the number/type of permits individual hunters receive and the number/sex of deer they harvest by permit type. As a final recommendation, it is suggested that budgetary consideration be given to provide for the hiring of a part-time employee to assist in the assemblage and distribution of statewide archery and firearm deer check station materials.

JOB 1 C

Analysis of highway kill

OBJECTIVE:

Monitor deer vehicle accidents on Illinois highways for the purpose of maintaining a county-by-county and statewide index of frequency, time of day and time of year that accidents occur. Results are utilized in estimating population densities which in turn are used in formulating harvest quotas. Future use of deer vehicle accident statistics include their inclusion (as an additional population parameter) into a statewide simulated deer population model. An additional use of these data is to alert the public of peak time periods of deer vehicle accidents, with the anticipated result of reduced vehicular accidents and human injuries. Appendix D identifies by county the number of deer-vehicle accidents.

ABSTRACT:

The Department of Conservation (DOC) receives an annual computer printout of deer-vehicle accidents from the Department of Transportation (DOT). While there is a delay of one year in this report, it still provides valuable information for maintaining an accident index. DOT maintains a data set for accidents occurring on State-owned and maintained highways and another which reports accidents occurring on all highways. Currently, DOC utilizes the accident information occurring only on State-owned or maintained roads. Appendix E illustrates the number of accidents, associated injuries and fatalities occurring during 1993 on a county-by-county basis as well as statewide basis. Appendix E depicts accidents occurring between 1983 and 1993 on a county-by-county and statewide basis.

Crop and orchard depredation investigations and recommendations.

Objective:

To identify annually an indicator of statewide deer population by compiling deer-vehicle accidents.

Abstract

SPECIAL DEER REMOVAL PERMITS. When deer densities increase, whether on a local or regional scale, landowners may experience more crop, orchard nursery and ornamental plant depredation. Additionally, an increase in deer densities can cause higher deer-vehicle accidents. There is no biological standard that clearly defines "high" density. Instead, high deer density is a relative term that will vary based on individual perceptions. The Department recognizes the need to balance the positive values associated with large numbers of deer with the willingness of publics and landowners to tolerate and accept varying levels of deer-human conflicts.

The Department's current management philosophy is to use public hunting as the primary means to regulate deer densities locally and statewide. The major factors that determine whether hunting is possible on areas include:

1. human safety (e.g., small nature preserves next to a public school);
2. property security (e.g., zones within a nuclear facility);
3. seasonal use by deer outside of hunting seasons (e.g., deer are absent from a site during the hunting season);
4. major conflicts with primary site function (e.g., airports); and
5. a combination of 1 thru 4.

When reduction or control of deer density is desired, the Department will enact more liberal regulations such as, but not limited to, adding more days to the regular firearm season, providing more seasons (e.g., muzzleloading and handgun) and/or increasing female harvest by issuing "bonus" antlerless-only and/or second-season permits.

Deer densities and frequency of depredation do not occur uniformly statewide. Therefore, the Department's deer management program must identify and address both local and regional concerns. Isolated local depredation typically occur within all Department administrative regions. Research carried out by the Illinois

Natural History Survey and the Department has identified three broader areas (northwest, west-central and southeast) within the state where landowners perceive deer densities to be excessive.

Deer removal permits are in no way intended to serve as long term management recommendations to alleviate excessive deer densities or to provide individuals with a recreational hunting opportunity. However, when deemed necessary, the Department may issue deer removal permits (in addition to public hunting) to reduce deer densities. These permits are issued either as Deer Removal Permits (DRP's) or as Deer Population Control Permits (DPCP's) and are valid for lands where:

1. Public hunting is a viable deer number reduction technique
 - a. public hunting is possible and allowed;
 - b. public hunting is possible but not allowed to the fullest extent possible due to landowner, homeowner or public sentiment or mission statement governing the property in question; or
2. Public hunting is not a viable deer management technique
 - a. public hunting is not possible due to concerns for human safety and/or precluded by federal, state, county or municipal statutes or ordinances.

Prior to 1991, deer depredation complaints had been handled by the Forest Wildlife Program with assistance from the Division's Management Section. Beginning in 1991 District Wildlife Managers became responsible for responding to deer related damage complaints in their districts. Interest from landowners in obtaining assistance continued to increase due in part to increased media coverage. As the number of complaints increased and intervention from special interest groups increased, the Forest Wildlife Program developed, and the Division adopted, an internal procedure protocol (Deer Depredation Protocol Manual [Appendix H] written and accepted in 1992) to address these concerns. Appendix F identifies the number of DRP's and Appendix G identifies the number of DPCP's issued and the number of deer taken respectively.

APPENDIX A

Illinois Firearm Deer Harvest Statistics By County Between 1992 and 1993

	1993	1993	1993	1992	CHANGE	PERCENT CHANGE
COUNTY	PERMITS	HARVEST	PERMIT SUCCESS	PERMIT SUCCESS	IN PERMIT SUCCESS BETWEEN 1992-1993	IN PERMIT SUCCESS BETWEEN 1992-1993
ADAMS	7193	3082	0.43	0.39	+0.04	.10
ALEXANDER	1111	308	0.28	0.25	+0.03	.12
BOND	2476	732	0.30	0.37	-0.07	-.19
BOONE	861	320	0.37	0.24	+0.13	.54
BROWN	3573	1710	0.48	0.44	+0.04	.09
BUREAU	2777	1017	0.37	0.28	+0.09	.32
CALHOUN	2738	937	0.34	0.32	+0.02	.06
CARROLL	2869	1032	0.36	0.29	+0.07	.24
CASS	1866	744	0.40	0.35	+0.05	.14
CHAMPAIGN	788	247	0.31	0.29	+0.02	.07
CHRISTIAN	1538	472	0.31	0.22	+0.09	.40
CLARK	2602	955	0.37	0.39	-0.02	-.05
CLAY	2590	890	0.34	0.35	-0.01	-.03
CLINTON	1936	465	0.24	0.28	-0.04	-.14
COLES	1736	501	0.29	0.31	-0.02	-.06
CRAWFORD	2490	1084	0.44	0.42	+0.02	.05
CUMBERLAND	1809	593	0.33	0.39	-0.06	-.15
DEKALB	1047	385	0.37	0.23	+0.14	.61
DEWITT	1035	400	0.39	0.34	+0.05	.15
DOUGLAS	581	178	0.31	0.29	+0.02	.07
EDGAR	1444	540	0.37	0.36	+0.01	.03
EDWARDS	1024	497	0.49	0.48	+0.01	.02
EFFINGHAM	2249	649	0.29	0.32	-0.03	-.01
FAYETTE	4372	1531	0.35	0.35	0.00	.00
FORD	306	121	0.40	0.31	+0.09	.29
FRANKLIN	2379	812	0.34	0.31	+0.03	.10
FULTON	5424	1869	0.34	0.32	+0.02	.06
GALLATIN	1576	594	0.38	0.36	+0.02	.06
GREENE	2840	1227	0.43	0.41	+0.02	.05
GRUNDY	1739	538	0.39	0.26	+0.13	.50
HAMILTON	2027	777	0.38	0.38	0.00	.00
HANCOCK	3703	1589	0.43	0.37	+0.06	.16
HARDIN	2373	848	0.36	0.35	+0.01	.03
HENDERSON	1666	633	0.38	0.37	+0.01	.03
HENRY	1542	621	0.40	0.31	+0.09	.29
IROQUOIS	2158	739	0.34	0.35	-0.01	-.03
JACKSON	7537	2683	0.36	0.37	-0.01	-.03
JASPER	2841	1096	0.39	0.42	-0.03	-.07
JEFFERSON	4004	1533	0.38	0.39	-0.01	-.03
JERSEY	2121	583	0.27	0.27	0.00	.00
JODAVIESS	6513	2504	0.38	0.35	+0.03	.09
JOHNSON	5863	2247	0.38	0.39	-0.01	-.03

Appendix A continued.

<u>COUNTY</u>			1993	1992	CHANGE	PERCENT CHANGE
	<u>1993</u>	<u>1993</u>	<u>PERMIT</u>	<u>PERMIT</u>	<u>IN PERMIT SUCCESS</u>	<u>IN PERMIT SUCCESS</u>
	<u>PERMITS</u>	<u>HARVEST</u>	<u>SUCCESS</u>	<u>SUCCESS</u>	<u>BETWEEN 1992-1993</u>	<u>BETWEEN 1992-1993</u>
KANKAKEE	965	221	0.23	0.17	+0.06	.35
KENDALL	470	107	0.23	0.18	+0.05	.28
KNOX	2839	1111	0.39	0.34	+0.05	.15
LASALLE	3233	1153	0.36	0.28	+0.08	.29
LAWRENCE	1453	670	0.46	0.42	+0.04	.10
LEE	2001	715	0.36	0.27	+0.09	.33
LIVINGSTON	1288	490	0.38	0.33	+0.05	.15
LOGAN	1025	377	0.37	0.41	-0.04	-.10
McDONOUGH	1923	831	0.43	0.38	+0.05	.13
McHENRY	2617	765	0.29	0.23	+0.06	.26
McLEAN	2084	810	0.39	0.38	+0.01	.03
MACON	720	220	0.31	0.29	+0.02	.07
MACOUPIN	5019	1527	0.30	0.33	-0.03	-.09
MADISON	3127	781	0.25	0.27	-0.02	-.08
MARION	3049	1056	0.35	0.33	+0.02	.06
MARSHALL	1550	598	0.39	0.35	+0.04	.11
MASON	1484	535	0.36	0.37	-0.01	-.03
MASSAC	1104	391	0.35	0.33	+0.02	.06
MENARD	1123	443	0.39	0.36	+0.03	.08
MERCER	2061	684	0.33	0.33	0.00	00
MONROE	2509	808	0.32	0.33	-0.01	.03
MONTGOMERY	3110	1156	0.37	0.39	-0.02	-.05
MORGAN	2438	1151	0.47	0.44	+0.03	.07
MOULTRIE	654	199	0.34	0.41	-0.07	-.17
OGLE	3609	1421	0.39	0.33	+0.06	.18
PEORIA	3467	1034	0.30	0.28	+0.02	.07
PERRY	4122	1675	0.41	0.42	-0.01	-.02
PIATT	435	149	0.34	0.30	+0.04	.13
PIKE	7637	3894	0.51	0.50	+0.01	.02
POPE	6377	2215	0.35	0.34	+0.01	.03
PULASKI	1653	767	0.46	0.45	+0.01	.02
PUTNAM	941	385	0.41	0.36	+0.05	.14
RANDOLPH	5452	2109	0.39	0.40	-0.01	-.03
RICHLAND	1659	699	0.42	0.41	+0.01	.02
ROCK ISLAND	2019	645	0.32	0.28	+0.04	.14
ST. CLAIR	3042	987	0.32	0.33	-0.01	-.03
SALINE	1884	639	0.34	0.33	+0.01	.03
SANGAMON	2296	727	0.32	0.32	0.00	00
SCHUYLER	3599	1549	0.43	0.38	+0.05	.13
SCOTT	1231	638	0.52	0.49	+0.03	.06
SHELBY	3268	1122	0.34	0.36	-0.02	-.06
STARK	486	194	0.40	0.34	+0.06	.18
STEPHENSON	2651	1161	0.44	0.24	+0.20	.83

Appendix A continued.

COUNTY	1993	1993	1993	1992	CHANGE	PERCENT CHANGE
	PERMITS	HARVEST	PERMIT SUCCESS	PERMIT SUCCESS	IN PERMIT SUCCESS BETWEEN 1992-1993	IN PERMIT SUCCESS BETWEEN 1992-1993
TAZEWELL	2206	706	0.32	0.34	- 0.02	-.06
UNION	5772	2103	0.36	0.37	-0.01	-.03
VERMILION	2651	884	0.33	0.32	+0.01	.03
WABASH	684	287	0.42	0.45	-0.03	-.07
WARREN	1331	534	0.40	0.35	+0.05	.14
WASHINGTON	3022	1064	0.35	0.38	-0.03	-.08
WAYNE	2691	1168	0.43	0.43	0.00	00
WHITE	1939	874	0.45	0.47	-0.02	-.04
WHITESIDE	1964	823	0.42	0.28	+0.14	-.50
WILL	1604	343	0.21	0.24	-0.03	-.12
WILLIAMSON*	4699	1503	0.34	0.32	+0.02	.06
WINNEBAGO	2271	789	0.35	0.26	+0.09	.35
WOODFORD	2098	857	0.41	0.38	+0.03	.08
CO. TOTALS	245923	91077	0.37	0.35	+0.02	+.06%

* Includes Crab Orchard harvest.

APPENDIX B

1993 ILLINOIS MUZZLELOADER DEER HARVEST

<u>COUNTY</u>	<u>PERMITS ISSUED</u>			<u>MALE</u>	<u>FEMALE</u>	<u>UNK.</u>	<u>TOTAL</u>
	<u>E-S</u>	<u>A-O</u>	<u>TOTAL</u>				
ADAMS	54	9	63	3	9	0	12
ALEXANDER	9	0	9	2	0	0	2
BOND	21	2	23	2	1	0	3
BOONE	20	2	22	1	2	0	3
BROWN	43	8	51	1	2	0	3
BUREAU	46	10	56	2	6	0	8
CALHOUN	18	1	19	1	2	0	3
CARROLL	44	3	47	2	1	0	3
CASS	31	2	33	1	4	0	5
CHAMPAIGN	20	2	22	5	1	0	6
CHRISTIAN	26	4	30	4	3	0	7
CLARK	28	1	29	1	3	0	4
CLAY	26	2	28	7	0	0	7
CLINTON	9	0	9	1	0	0	1
COLES	25	2	27	0	3	1	4
COOK	X	X	X	X	X	X	X
CRAWFORD	33	4	37	4	11	0	15
CUMBERLAND	24	3	27	2	2	0	4
DEKALB	20	6	26	1	2	0	3
DEWITT	19	2	21	4	5	0	9
DOUGLAS	14	2	16	2	0	0	2
DUPAGE	X	X	X	X	X	X	X
EDGAR	20	2	22	5	2	0	7
EDWARDS	6	0	6	1	1	0	2
EFFINGHAM	20	0	20	2	3	0	5
FAYETTE	50	4	54	3	5	0	8
FORD	12	0	12	0	2	0	2
FRANKLIN	34	6	40	2	6	0	8
FULTON	76	3	79	3	4	0	7
GALLATIN	12	1	13	1	2	0	3
GREENE	31	3	34	1	2	0	3
GRUNDY	20	2	22	0	0	0	0
HAMILTON	12	2	14	1	3	0	4
HANCOCK	28	2	30	2	2	0	4
HARDIN	15	0	15	2	2	0	4
HENDERSON	13	0	13	0	0	0	0
HENRY	26	5	31	1	1	0	2
IROQUOIS	26	6	32	4	2	0	6
JACKSON	80	11	91	3	2	0	5

Appendix B continued.

<u>COUNTY</u>	<u>PERMITS ISSUED</u>			<u>MALE</u>	<u>FEMALE</u>	<u>UNK.</u>	<u>TOTAL</u>
	<u>E-S</u>	<u>A-O</u>	<u>TOTAL</u>				
JASPER	32	2	34	0	1	0	1
JEFFERSON	32	2	34	3	0	0	3
JERSEY	24	3	27	5	1	0	6
JODAVIESS	82	8	90	4	3	0	7
JOHNSON	67	4	71	12	10	0	22
KANE	X	X	X	X	X	X	X
KANKAKEE	20	0	20	0	0	0	0
KENDALL	20	0	20	1	1	0	2
KNOX	24	5	29	0	2	0	2
LAKE	X	X	X	X	X	X	X
LASALLE	49	10	59	3	5	0	8
LAWRENCE	19	1	20	3	1	0	4
LEE	26	1	27	0	1	0	1
LIVINGSTON	19	0	19	1	1	0	2
LOGAN	16	1	17	0	2	0	2
MACON	20	0	20	1	1	0	2
MACOUPIN	60	16	76	3	3	0	6
MADISON	49	3	52	1	1	0	2
MARION	32	1	33	5	2	0	7
MARSHALL	28	3	31	2	0	0	2
MASON	22	2	24	3	2	0	5
MASSAC	17	3	20	0	0	0	0
MCDONOUGH	22	5	27	0	2	0	2
MCHENRY	40	10	50	0	2	0	2
MCLEAN	24	4	28	2	2	0	4
MENARD	10	1	11	0	1	0	1
MERCER	34	4	38	0	0	0	0
MONROE	29	0	29	1	1	0	2
MONTGOMERY	41	1	43	3	4	0	7
MORGAN	29	3	32	1	4	0	5
MOULTRIE	20	5	25	2	2	0	4
OGLE	51	19	70	2	2	0	4
PEORIA	58	5	63	2	1	0	3
PERRY	49	2	51	4	12	0	16
PIATT	9	0	9	0	0	0	0
PIKE	63	12	75	3	23	0	26
POPE	73	0	73	7	3	0	10
PULASKI	8	1	9	1	2	0	3
PUTNAM	18	2	20	2	1	0	3
RANDOLPH	53	5	58	9	4	0	13
RICHLAND	13	0	13	4	0	0	4

Appendix B continued.

COUNTY	PERMITS ISSUED			MALE	FEMALE	UNK.	TOTAL
	E-S	A-O	TOTAL				
ROCK ISLAND	43	3	46	0	3	0	3
SALINE	16	0	16	2	0	0	2
SANGAMON	35	3	38	0	2	0	2
SCHUYLER	41	4	45	2	3	0	5
SCOTT	18	0	18	0	2	0	2
SHELBY	38	3	41	1	4	0	5
ST. CLAIR	44	5	49	1	3	0	4
STARK	8	0	8	1	0	0	1
STEPHENSON	33	4	37	1	1	0	2
Tazewell	30	3	33	0	1	0	1
UNION	76	10	86	10	16	0	26
VERMILION	44	8	52	2	3	0	5
WABASH	9	3	12	1	1	0	2
WARREN	14	1	15	0	2	0	2
WASHINGTON	26	2	28	0	1	0	1
WAYNE	14	2	16	1	3	0	4
WHITE	15	2	17	1	1	0	2
WHITESIDE	39	4	43	2	0	0	2
WILL	26	3	29	1	2	0	3
WILLIAMSON	65	8	73	1	0	0	1
WINNEBAGO	37	2	39	1	3	0	4
WOODFORD	33	2	35	3	5	0	8
TOTAL	3017	329	3346	198	255	1	454

APPENDIX C

1993 ILLINOIS ARCHERY DEER HARVEST

<u>COUNTY</u>	<u>MALE</u>	<u>FEMALE</u>	<u>UNK.</u>	<u>TOTAL</u>
ADAMS	111	70	1	182
ALEXANDER	35	15	0	50
BOND	81	62	0	143
BOONE	68	61	0	129
BROWN	118	78	0	196
BUREAU	123	73	0	196
CALHOUN	80	28	0	108
CARROLL	117	74	2	193
CASS	79	44	1	124
CHAMPAIGN	94	78	2	174
CHRISTIAN	85	64	0	149
CLARK	99	57	0	156
CLAY	95	64	0	159
CLINTON	58	44	0	102
COLES	92	68	2	162
COOK	78	33	0	111
CRAWFORD	192	104	1	297
CUMBERLAND	73	48	0	121
DEKALB	77	61	2	140
DEWITT	78	54	0	132
DOUGLAS	46	20	0	66
DUPAGE	45	25	0	70
EDGAR	105	75	0	180
EDWARDS	63	36	0	99
EFFINGHAM	77	68	0	145
FAYETTE	155	100	1	256
FORD	30	8	0	38
FRANKLIN	118	87	2	207
FULTON	236	108	0	344
GALLATIN	48	32	0	80
GREENE	69	55	0	124
GRUNDY	140	79	0	219
HAMILTON	58	34	2	94
HANCOCK	109	58	0	167
HARDIN	77	40	0	117
HENDERSON	68	26	0	94
HENRY	86	77	0	163
IROQUOIS	196	132	0	328
JACKSON	279	143	1	423
JASPER	131	90	0	221

Appendix C continued.

<u>COUNTY</u>	<u>MALE</u>	<u>FEMALE</u>	<u>UNK.</u>	<u>TOTAL</u>
JEFFERSON	241	174	1	416
JERSEY	104	48	0	152
JODAVIESS	137	84	1	222
JOHNSON	245	129	1	375
KANE	119	62	0	181
KANKAKEE	67	30	0	97
KENDALL	42	32	0	74
KNOX	146	75	0	221
LASALLE	312	203	0	515
LAWRENCE	97	76	0	173
LEE	77	55	0	132
LAKE	315	161	2	478
LIVINGSTON	76	51	0	127
LOGAN	70	46	0	116
MACON	123	77	0	200
MACOUPIN	188	141	0	329
MADISON	144	108	2	254
MARION	161	103	0	264
MARSHALL	40	26	0	66
MASON	147	102	1	250
MASSAC	88	32	1	121
MCDONOUGH	92	42	0	134
MCHENRY	377	192	1	570
MCLEAN	179	130	0	309
MENARD	50	40	0	90
MERCER	41	11	0	52
MONROE	43	28	0	71
MONTGOMERY	141	113	0	254
MORGAN	155	88	0	243
MOULTRIE	52	27	0	79
OGLE	300	148	2	450
PEORIA	225	128	0	353
PERRY	111	97	3	211
PIATT	56	31	0	87
PIKE	355	225	1	581
POPE	146	83	0	229
PULASKI	70	40	0	110
PUTNAM	33	44	0	77
RANDOLPH	247	146	3	396
RICHLAND	37	78	0	165
ROCK ISLAND	129	63	0	196
SALINE	100	49	2	151

Appendix C continued.

<u>COUNTY</u>	<u>MALE</u>	<u>FEMALE</u>	<u>UNK.</u>	<u>TOTAL</u>
SANGAMON	119	94	0	213
SCHUYLER	113	50	0	163
SCOTT	35	18	0	53
SHELBY	153	97	1	251
ST. CLAIR	173	123	0	296
STARK	31	21	0	52
STEPHENSON	142	61	0	203
TAZEWELL	190	105	0	295
UNION	194	127	2	323
VERMILION	285	220	2	507
WABASH	61	51	1	113
WARREN	50	28	0	78
WASHINGTON	112	89	0	201
WAYNE	122	113	0	235
WHITE	88	52	0	140
WHITESIDE	108	69	0	177
WILL	331	192	2	525
WILLIAMSON	241	128	0	369
WINNEBAGO	210	153	0	363
WOODFORD	134	94	0	228
UNK. COUNTY				2403
TOTAL	12789	7976	46	23214

APPENDIX D

Deer Vehicle Accidents Reported On State Owned Or Maintained Highways

<u>County</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>	<u>1990</u>	<u>1991</u>	<u>1992</u>	<u>1993</u>
1 ADAMS	57	71	67	105	72	111	143	125	117	152	159
2 ALEXANDER	7	14	14	14	15	12	18	22	19	23	22
3 BOND	14	20	20	28	37	41	47	64	44	50	54
4 BOONE	18	43	26	39	46	45	53	59	56	67	55
5 BROWN	9	14	20	10	13	18	20	34	41	39	50
6 BUREAU	42	35	60	65	43	71	57	37	130	124	93
7 CALHOUN	10	17	13	27	32	20	24	8	26	29	18
8 CARROLL	30	32	29	51	46	61	87	76	85	77	81
9 CASS	6	16	12	19	16	26	23	36	37	36	43
10 CHAMPAIGN	28	46	39	67	65	82	100	124	111	148	124
11 CHRISTIAN	22	27	25	29	36	48	46	58	48	55	64
12 CLARK	32	41	40	54	61	57	63	30	75	87	79
13 CLAY	7	22	18	19	24	41	38	54	58	55	41
14 CLINTON	18	17	16	26	28	33	30	44	38	46	34
15 COLES	33	37	52	59	73	77	81	78	91	116	98
16 COOK	255	354	380	469	436	494	499	610	655	707	645
17 CRAWFORD	25	34	58	60	62	78	79	104	104	114	115
18 CUMBERLAND	14	20	21	24	28	47	52	48	76	49	56
19 DEKALB	16	17	20	38	45	56	49	58	74	58	66
20 DEWITT	19	22	24	27	64	59	51	49	65	93	67
21 DOUGLAS	9	7	12	16	22	17	22	24	22	21	39
22 DUPAGE	31	50	58	76	72	85	74	109	106	135	127
23 EDGAR	21	18	29	21	42	30	31	40	58	58	44
24 EDWARDS	6	9	21	21	21	24	26	36	42	43	36
25 EFFINGHAM	25	40	50	59	70	88	85	109	95	101	100
26 FAYETTE	22	37	32	56	53	47	83	77	78	74	93
27 FORD	7	12	9	14	16	27	19	25	28	31	34
28 FRANKLIN	49	53	57	93	86	108	105	122	135	150	149
29 FULTON	35	61	60	64	76	94	85	98	125	120	156
30 GALLATIN	2	4	7	4	9	6	12	15	10	16	10
31 GREENE	15	30	34	40	36	49	44	54	70	67	62
32 GRUNDY	22	16	29	41	41	43	61	64	64	83	69
33 HAMILTON	9	12	8	20	13	11	17	5	15	28	8
34 HANCOCK	29	35	27	37	45	64	72	69	101	77	70
35 HARDIN	4	6	20	13	14	12	16	28	27	11	35
36 HENDERSON	19	19	16	27	28	38	24	21	55	34	63
37 HENRY	36	41	53	73	94	99	96	119	139	142	146
38 IROQUOIS	29	29	49	59	51	57	90	93	96	104	121
39 JACKSON	69	90	85	111	127	155	207	223	242	213	203
40 JASPER	10	16	18	22	27	25	31	21	43	40	39
41 JEFFERSON	53	65	82	100	90	119	126	159	130	142	110

Appendix D continued.

<u>County</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>	<u>1990</u>	<u>1991</u>	<u>1992</u>	<u>1993</u>
42 JERSEY	23	33	34	50	55	54	56	59	80	74	65
43 JODAVIESS	39	44	47	63	60	65	76	94	100	76	77
44 JOHNSON	30	42	49	36	48	73	87	85	112	116	112
45 KANE	68	80	81	124	125	150	190	216	212	242	236
46 KANKAKEE	18	40	30	35	46	53	59	60	83	75	86
47 KENDALL	12	25	27	26	43	51	45	46	69	70	54
48 KNOX	32	30	31	40	57	64	70	89	70	105	85
49 LAKE	126	157	200	250	274	298	359	346	404	458	426
50 LASALLE	46	71	78	99	102	124	152	172	182	186	183
51 LAWRENCE	17	21	27	43	45	48	61	81	73	84	101
52 LEE	33	52	33	88	84	85	111	132	110	151	145
53 LIVINGSTON	18	19	25	37	46	44	47	72	84	82	73
54 LOGAN	11	19	15	27	32	44	41	28	55	58	76
55 MCDONOUGH	13	16	18	17	26	31	31	36	41	55	55
56 MCHENRY	120	117	129	165	193	237	250	269	322	315	293
57 MCLEAN	22	41	46	78	77	89	72	100	104	127	111
58 MACON	27	43	38	49	61	62	67	95	99	107	87
59 MACOUPIN	33	38	58	58	70	80	102	95	123	113	136
60 MADISON	66	84	88	148	131	180	207	193	232	242	228
61 MARION	25	43	42	63	78	85	90	120	107	121	105
62 MARSHALL	19	16	21	30	30	29	51	46	55	56	65
63 MASON	1	9	7	19	15	9	18	22	33	31	48
64 MASSAC	16	15	10	23	29	35	49	53	52	53	74
65 MENARD	2	16	14	9	14	21	21	6	35	29	19
66 MERCER	13	18	15	18	6	24	23	28	26	38	33
67 MONROE	16	27	22	36	31	36	33	55	46	35	49
68 MONTGOMERY	24	44	38	33	48	67	81	84	92	82	89
69 MORGAN	35	39	41	56	74	75	71	88	95	109	102
70 MOULTRIE	15	26	18	20	37	35	36	21	20	21	16
71 OGLE	72	83	86	100	108	125	113	147	135	177	173
72 PEORIA	68	92	73	128	131	141	149	178	146	182	225
73 PERRY	36	59	76	76	83	86	103	109	139	99	124
74 PIATT	13	20	13	22	11	25	27	33	23	47	28
75 PIKE	70	90	66	112	111	129	153	216	241	253	287
76 POPE	4	6	11	17	14	19	23	22	14	29	44
77 PULASKI	9	11	13	22	12	14	31	37	53	47	53
78 PUTNAM	15	24	14	20	20	24	17	26	33	31	35
79 RANDOLPH	38	45	58	76	74	77	85	117	122	89	99
80 RICHLAND	18	25	31	34	38	43	49	49	54	53	55
81 ROCK ISLAND	58	69	57	78	89	88	87	114	120	119	118
82 ST. CLAIR	46	58	82	95	102	109	107	162	161	177	167
83 SALINE	25	21	27	39	46	47	66	79	83	83	99
84 SANGAMON	40	68	56	113	112	155	182	192	185	167	215
85 SCHUYLER	22	23	32	32	33	34	57	57	44	54	79
86 SCOTT	6	15	13	18	31	29	34	28	48	48	34

Appendix D continued.

<u>County</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>	<u>1990</u>	<u>1991</u>	<u>1992</u>	<u>1993</u>
87 SHELBY	19	26	32	44	38	34	49	46	61	39	60
88 STARK	6	5	7	7	5	13	19	17	18	15	19
89 STEPHENSON	39	50	46	50	70	85	113	88	121	95	117
90 TAZEWELL	35	51	49	70	64	85	98	121	103	128	146
91 UNION	41	51	45	45	66	61	73	90	105	91	100
92 VERMILION	61	65	69	75	108	116	107	122	104	103	105
93 WABASH	10	8	14	20	9	14	24	34	33	28	25
94 WARREN	7	16	18	19	28	35	33	37	44	52	46
95 WASHINGTON	19	26	37	47	39	44	48	71	81	64	76
96 WAYNE	17	19	26	32	33	41	39	41	52	76	73
97 WHITE	18	23	41	27	41	65	59	72	80	83	83
98 WHITESIDE	37	37	38	47	48	56	57	50	63	95	83
99 WILL	74	92	123	158	156	180	217	280	263	276	261
100 WILLIAMSON	86	81	96	123	125	147	166	179	188	196	208
101 WINNEBAGO	102	130	143	198	214	208	220	197	201	228	223
102 WOODFORD	<u>17</u>	<u>16</u>	<u>33</u>	<u>34</u>	<u>30</u>	<u>42</u>	<u>41</u>	<u>45</u>	<u>61</u>	<u>62</u>	<u>52</u>
TOTALS	3212	4179	4517	5915	6301	7294	8088	9076	9926	10412	10419

Appendix E

1993 Illinois Deer Vehicle Accidents on State Owned or Maintained Highways

<u>County</u>	<u>Number of Accidents W/Injuries</u>	<u>Number of Injuries</u>	<u>Deaths</u>
1 ADAMS	9	11	
2 ALEXANDER	0		
3 BOND	3	5	
4 BOONE	1	1	
5 BROWN	1	1	
6 BUREAU	6	7	
7 CALHOUN	0		
8 CARROLL	2	3	
9 CASS	9	9	
10 CHAMPAIGN	6	8	
11 CHRISTIAN	0		
12 CLARK	2	2	
13 CLAY	1	1	
14 CLINTON	1	1	
15 COLES	4	5	
16 COOK	25	29	
17 CRAWFORD	4	4	
18 CUMBERLAND	2	2	
19 DEKALB	3	3	
20 DEWITT	2	2	
21 DOUGLAS	2	2	
22 DUPAGE	11	12	
23 EDGAR	2	4	
24 EDWARDS	3	3	
25 EFFINGHAM	7	8	
26 FAYETTE	3	3	
27 FORD	1	1	
28 FRANKLIN	6	6	
29 FULTON	4	4	
30 GALLATIN	0		
31 GREENE	1	1	
32 GRUNDY	3	4	
33 HAMILTON	2	2	
34 HANCOCK	2	2	
35 HARDIN	3	3	
36 HENDERSON	1	1	
37 HENRY	7	9	
38 IROQUOIS	4	4	
39 JACKSON	7	9	

Appendix E continued.

<u>County</u>	<u>Number of Accidents W/Injuries</u>	<u>Number of Injuries</u>	<u>Deaths</u>
40 JASPER	1	1	
41 JEFFERSON	2	2	
42 JERSEY	4	4	
43 JODAVIESS	1	1	
44 JOHNSON	2	2	
45 KANE	11	14	
46 KANKAKEE	1	1	
47 KENDALL	4	5	
48 KNOX	6	7	
49 LAKE	10	13	
50 LASALLE	5	5	
51 LAWRENCE	5	7	
52 LEE	6	8	
53 LIVINGSTON	5	7	
54 LOGAN	5	5	
55 MCDONOUGH	3	3	
56 MCHENRY	9	10	
57 MCLEAN	4	7	
58 MACON	5	6	
59 MACOUPIN	5	5	
60 MADISON	12	13	
61 MARION	4	5	
62 MARSHALL	3	3	
63 MASON	1	1	
64 MASSAC	4	4	
65 MENARD	1	1	
66 MERCER	2	2	
67 MONROE	0		
68 MONTGOMERY*			1
69 MORGAN	6	6	
70 MOULTRIE	0		
71 OGLE	4	6	
72 PEORIA	12	15	
73 PERRY	3	3	
74 PIATT	0		
75 PIKE	11	11	
76 POPE	3	4	1
77 PULASKI	3	3	
78 PUTNAM	2	2	
79 RANDOLPH	0		
80 RICHLAND	3	3	
81 ROCK ISLAND	5	5	

Appendix E continued.

<u>County</u>	<u>Number of Accidents W/Injuries</u>	<u>Number of Injuries</u>	<u>Deaths</u>
82 ST. CLAIR	8	9	
83 SALINE	5	6	
84 SANGAMON	13	16	
85 SCHUYLER	2	2	
86 SCOTT	1	1	
87 SHELBY	1	1	
88 STARK	2	2	
89 STEPHENSON	3	3	
90 TAZEWELL	5	6	
91 UNION	2	2	
92 VERMILION	4	5	
93 WABASH	1	1	
94 WARREN	4	4	
95 WASHINGTON	3	3	
96 WAYNE	3	3	
97 WHITE	5	6	
98 WHITESIDE	1	1	
99 WILL	12	12	
100 WILLIAMSON	6	6	
101 WINNEBAGO	11	11	
102 WOODFORD	0		
TOTALS	416	477	2**

* Single occupant.

** 3 additional deaths on roads other than State-owned or maintained.

APPENDIX F

DEER REMOVAL PERMITS ISSUED AND KILL REPORT
1 JANUARY THROUGH 31 DECEMBER 1993

<u>COUNTY</u>	<u>DEER ALLOWED</u>	<u>DEER TAKEN</u>	<u>PERMITS ISSUED</u>	<u>PERMITS RETURNED</u>
ADAMS	34	17	9	7
BOND	4	0	2	2
BOONE	70	38	7	6
BROWN	34	10	4	2
CARROLL	55	16	6	4
CASS	3	3	1	1
CHAMPAIGN	35	24	9	9
CHRISTIAN	8	0	4	3
CLARK	8	0	2	0
COOK	6	0	1	0
DEKALB	5	4	1	1
DUPAGE	19	2	4	4
EDGAR	5	1	1	1
FAYETTE	12	3	3	3
FRANKLIN	3	2	1	1
FULTON	4	2	2	2
GREENE	4	3	2	2
GRUNDY	66	51	7	7
HARDIN	2	0	1	1
JACKSON	90	79	12	12
JASPER	2	2	1	1
JOHNSON	25	13	4	4
KANE	16	4	5	2
KANKAKEE	14	10	2	2
KENDALL	1	0	1	1
LAKE	18	3	3	3
LASALLE	28	8	4	4
LEE	10	10	1	1
LIVINGSTON	8	2	2	2
MACON	2	0	1	1
MACOUPIN	21	12	8	7
MADISON	9	1	3	3
MARION	11	4	3	3
MASON	2	0	1	1
MCHENRY	55	14	7	4
MCLEAN	34	27	7	7

APPENDIX F. Continued

<u>COUNTY</u>	<u>DEER ALLOWED</u>	<u>DEER TAKEN</u>	<u>PERMITS ISSUED</u>	<u>PERMITS RETURNED</u>
MENARD	2	0	1	1
MONTGOMERY	7	2	2	1
OGLE	50	39	5	5
PERRY	3	2	1	1
PIKE	86	38	21	21
PIKE/BROWN	4	4	1	1
POPE	2	2	1	1
Pulaski	6	6	1	1
RANDOLPH	6	4	2	2
ROCK ISLAND	9	1	3	3
SALINE	4	2	1	1
SALINE/WILLIAM.	10	10	2	2
SANGAMON	2	0	1	1
SCHUYLER	5	5	1	1
ST. CLAIR	6	0	2	2
STEPHENSON	7	2	2	2
UNION	43	25	9	9
UNION/JOHNSON	5	5	1	1
VERMILION	36	22	7	7
WASHINGTON	8	1	3	2
WHITESIDE	6	0	3	3
WILL	10	5	3	3
WINNEBAGO	60	29	5	5
WOODFORD	3	3	1	1
TOTALS	1103	572	211	190

APPENDIX G

Deer population reduction/control programs in northern Illinois authorized via DPCP. Number of deer permitted for removal is followed by the actual number collected in parentheses.

Site	Size (ha)	1990-91	1991-92	1992-93	1993-94
Northeastern Illinois					
Chicago Botanic Gardens*	121	30(24)	30(3)	20(12)	20(2)
City of Lake Forest	2590+	N/A	20(11)a	70(33)	72(69)
FPD of Cook Co.					
a) Bemis Woods	514	N/A	N/A	N/A	30(30)
b) Busse Woods	1508	30(16)	40(40)	40(21)	50(50)
c) Camp Sagawau	22	N/A	30(21)	20(4)	N/A
d) Crabtree NC	669	N/A	N/A	30(10)	N/A
e) Glenwood/Zanders	1699	N/A	N/A	30(0)	30(29)
f) Palos (West) Div.	1178	N/A	N/A	45(44)	50(50)
g) River Trails NC	239	30(6)	40(23)	40(23)	30(30)
h) Skokie Division	449	N/A	N/A	15(12)b	30(22)
i) Somme/Chipilly	297	N/A	N/A	30(10)	30(23)
FPD of DuPage Co.					
a) Fischer Woods	45	N/A	N/A	N/A	8(0)
b) Fullersburg Woods	85	N/A	N/A	N/A	15(4)
c) Lyman Woods	37	N/A	N/A	N/A	8(5)
d) Meacham Grove	93	N/A	N/A	N/A	22(12)
e) Waterfall Glen & Wood Ridge	1094	N/A	N/A	400(253)	610(579)
f) W. Chicago Prairie	122	N/A	N/A	N/A	35(30)
g) Wood Dale Grove & Salt Creek Park	96	N/A	N/A	N/A	21(12)
Lake Co. FPD					
a) Lloyd & Wright Wds.	254	N/A	N/A	18(18)	25(15)
b) MacArthur Woods	204	N/A	42(25)	15(12)	25(0)d
c) Ryerson Cons. Area	223	28(28)c	19(19)	12(12)	20(0)d
Morton Arboretum	607	45(36)	35(25)	55(43)	70(57)
O'Hare Airport	3238	N/A	N/A	30(0)d	100(59)

cont.

Appendix G: Continued.

Site	Size (ha)	1990-91	1991-92	1992-93	1993-94
The Grove Nat'l Historic Landmark, Glenview Park District	35	N/A	30(13)	N/A	20(9)
Village of Bannockburn	518+	N/A	N/A	N/A	30(29)
Village of Glencoe	997	N/A	N/A	N/A	30(18)
Northwestern Illinois					
Galena Territory Assc.	2720	50(34)	600(600)	300(230)	200(50)
Lake Carroll POA	2200	N/A	N/A	290(290)	313(190)
Total # of programs/sites		6	10	18	26
Total # of deer permitted		213	886	1,460	1,894
Total # of deer collected		144	780	1,027	1,361
Lbs. of venison donated		?	≥28,584	39,387	49,359

FPD = Forest Preserve District; N/A = Not Applicable/no removal program.
a Removal program initially started on a 40ha property owned by Lake Forest Open Lands Association.
b Collected under Scientific Collecting Permit.
c Included attempts to live-capture and translocate.
d DPCP issued but not used by agency.

APPENDIX H

TABLE OF CONTENTS

History	1
Permit Issuance	3
Land Classification	3
Permit Classification	3
Unauthorized Use of DRP's	4
Appendix A - Issuance of DRPs (≤ 10)	6
Deer Complainant Log	11
Deer Removal Permit (DRP)	12
Disposition of Carcass Report Form	13
Appendix B - Issuance of DPCPs	14
Deer Population Control Permit (DPCP)	19
Appendix C - Sharpshooter Certification	20
Appendix D - Deer Control/Damage Abatement Techniques	23
Literature Cited	34
Appendix E - Ornamental Plants Browsed By Deer	38
Resistance of Woody Ornamental Plants to Deer Damage	42
Appendix F - Dead Animal Disposal Act	45
Appendix G - Good Samaritan Food Donor Act	46
Appendix H - Vendors of Abatement Materials	49

HISTORY OF WHITE-TAILED DEER IN ILLINOIS

Deer numbers have increased dramatically in Illinois since they were virtually extirpated from the state by the late 1800's (Pietsch 1954). Prior to 1950, occasional escapes/releases of deer from privately-owned preserves, translocations conducted by the Illinois Department of Conservation and the United States Forest Service, and possibly immigration of deer from adjacent states led to the reintroduction of white-tailed deer to Illinois. Additionally, the high reproductive potential of healthy whitetails, their ability (and adaptability) to rapidly colonize suitable habitat and favorable land use practices (e.g., agriculture, large acreage residential lots with food and cover) have resulted in a rapid increase in deer numbers and distribution statewide. By 1950, whitetails were observed in 68 counties, and 33 counties were opened for deer hunting in 1957. All except the 4 counties in the Chicago metropolitan area (i.e., Cook, DuPage, Kane, and Lake) were opened to firearm harvest of deer in 1975.

Numbers of whitetails have continued to increase throughout Illinois. This increase is exemplified by increases in annual hunter harvest and hunter success rates. Record numbers of deer were legally harvested by hunters every year during the 1980's while (firearm) hunter success appeared to stabilize at 45-47%. In 1980, 20,700 deer were harvested by 75,800 permittees statewide; the harvest increased to 82,130 taken by 206,176 permittees in 1991.

Unfortunately, the increase in deer numbers statewide has resulted in a greater incidence of deer-vehicle accidents; reported accidents on State-maintained/-numbered routes (not including county and city roads) involving white-tailed deer increased from 2,345 in 1981 to 9,076 in 1990. This type of deer-human interaction is probably most pronounced in the 4 highly urbanized counties in NE Illinois. Not surprisingly, Cook County has ranked highest among Illinois counties in the number of reported deer-vehicle collisions on State highways (e.g., 172 in 1981 up to 610 in 1990). Damage to native forest vegetation by excessive deer browsing has been documented on several remnant natural areas. High deer numbers have led to increased reports of damage to agricultural crops, nursery and orchard stock, ornamental plantings, cemeteries, and golf courses. Additionally, deer pose a threat to human safety when allowed to reside on airport properties and to wander unimpeded onto active runways. Incidences of "displaced" deer, deer appearing in cities, in fenced yards/compounds, and in buildings, have also increased.

Due to the increase in negative deer-human interactions statewide, the Illinois deer hunting seasons were significantly modified for 1991. The firearm season was lengthened from 6 days (two 3-day seasons) to 7 days, an exclusive 3-day muzzleloader season was added during December, an experimental 3-day handgun season during January 1992 was added, an additional antlerless-only archery permit was made available, and emphasis (via permit allocation and public education) was placed on the need to harvest more females/does. Management has been focused upon the smallest land unit possible at this time; quotas were, and will continue to be set, on a county-by-county basis in order to attain "desirable" deer densities. Generally speaking, desirable deer densities in ideal habitat are often stated as being approximately 18-25 deer per square mile; however, "acceptable" densities must be based upon biological, as well as social

and economic considerations, must be determined on a site-specific basis but in a regional context, and must be continually evaluated over time.

ILLINOIS DEPARTMENT OF CONSERVATION'S ROLE IN DEER DAMAGE ABATEMENT

The management of white-tailed deer in Illinois is the responsibility of the Illinois Department of Conservation (IDOC). The IDOC is responsible for taking "all measures necessary for the conservation, distribution, introduction, and restoration of birds and mammals" (Section 1.10, Article I, Chapter 61, Illinois Wildlife Code). Furthermore, "ownership of, and title to, all wild birds and wild mammals within the jurisdiction of the State are declared to be in the State, and no wild birds or wild mammals shall be taken or killed, in any manner or at any time, unless the person(s) so taking or killing the same shall consent that the title thereto shall be and remain in the State for the purpose of regulating the taking, killing, possession, use, sale, and transportation thereof, after such taking or killing, as hereinafter set forth" (Section 2.1, Article II, Chapter 61, Illinois Wildlife Code).

In situations where deer numbers are locally excessive, the responsibility of documenting deer-related damage and managing deer numbers must be assumed, at least in part, by the individual landowner or land-managing agency/organization (e.g., county forest preserve or park district, municipality, homeowner's association, etc.). The IDOC personnel serve in an extension capacity by providing up-to-date information on deer population management alternatives (based upon field-proven applications, research funded by the IDOC, and research conducted nationwide), deer damage abatement techniques, methods of evaluating population levels and extent of deer damage, and procedures/regulations for initiating and conducting deer removal programs. Additionally, IDOC personnel will provide on-site evaluations of deer damage and site-specific recommendations on abatement.

To this end, the IDOC funded the 6.5 year (Fall 1983 - Summer 1990) Urban Deer Research Study (conducted by the Illinois Natural History Survey) and initiated the Urban Deer Management Project in November 1988 to specifically address the concerns of citizens and public land managers about increasing incidences of deer-related damage in Cook, Lake, DuPage, and Kane counties, as well as other metropolitan areas statewide. However, due to the magnitude of complaints concerning deer depredations, the only feasible or practical arrangement is for the complainant to determine/document if a "deer problem" actually exists, to obtain the appropriate permits, and to select and implement the most effective management techniques.

The IDOC currently offers no compensation or reimbursement to landowners for deer damage. This is also true for motorists involved in deer-vehicle accidents. In the latter case, the motorist is allowed to claim the deer carcass but must report such to the local IDOC Regional Law Enforcement Office within 24 hours, or the next regular workday (Section 750.10, Part 750, Subchapter b, Chapter I, Title 17, Illinois Administrative Code).

ILLINOIS DEPARTMENT OF CONSERVATION
PROTOCOL FOR THE ISSUANCE OF DEER REMOVAL PERMITS

Division of Wildlife Resources' Biologists (District Wildlife Biologists [DWBs] and Private Land Biologists [PLBs]) will be responsible for working with private landowners and private and public land managers and agency administrators (hereafter referred to as complainants) in evaluating and documenting a deer damage control policy via the following standardized procedure.

Upon receiving a deer damage complaint, the biologist will contact the complainant within 5 working days to establish an inspection date within the following 5 working days or a mutually agreed upon date. An example of an exception to this time frame would be when human safety may be compromised, (e.g., airport authority concerns with deer on runways). When human safety is a concern, a biologist will meet with the complainant immediately or will give verbal permission followed with a site-evaluation within 48 hours.

Biologists of the Department need not attempt to evaluate damage if the property owner (or his representative) cannot meet with them. Without the landowner experiencing the damage present, alternative methods of abating damage cannot be explained. If damage control is warranted, landowners must be willing to amend their schedule to meet with the Department biologist. The initial deer removal permit will not be issued over the phone without a field evaluation except in the aforementioned cases involving immediate threats to human safety or health.

To augment control of deer damage the Department may issue deer removal permits. Permits will be issued under one of the following three land-use classifications (for additional clarification refer to the cited appendices):

1. Properties where public hunting is suitable and will serve as a viable deer damage control measure (Appendix A);
2. Properties where public hunting is possible but not allowed to the fullest extent due to landowner, homeowner or public sentiment or mission statement (encumbrance) governing the property in question (Appendix A); or
3. Properties where public hunting is not possible due to concerns for human safety and/or precluded by federal, state, county or municipal statutes or ordinances (Appendix A/B).

Permits will be issued to reduce deer numbers by one of the following permit classifications (for additional clarification refer to appendices):

1. Deer Removal Permits (DRPs) issued for the removal of individual deer (≤ 10) perceived as causing excessive economic loss (Appendix A);
2. Deer Population Control Permits (DPCPs) issued to agencies, organizations or associations only to reduce and control deer

populations at specified levels. Issuance of DPCP's will be by the Forest Wildlife Program only. (Appendix B); or

3. Special DRPs or DPCPs to remove deer perceived as threatening human safety and/or health may be issued immediately at the discretion of biologist but must be approved (within 24 hours of issuance) by the Forest Wildlife Program. (Appendix A/B).

DRPs will not be authorized :

1. to remove deer during or between the regular firearm deer seasons (except in counties closed to such). An exception to this would be the issuance of a DRP authorizing the use of cracker shells or plastic slugs to "haze" deer.
2. to remove deer that damage wildlife food plots/plantings.
3. to remove deer that damage family garden plots and/or "truck farms" less than 5 acres in size (recommend fencing) unless to augment other techniques recommended by the authorizing biologist which are being seriously employed by the landowner.
4. to remove deer damaging Christmas tree plantings, orchards and nurseries less than 10 acres in size (individual field) unless to augment other techniques recommended by the authorizing biologist which are being seriously employed by the landowner.
5. to remove deer that damage residential ornamental plantings (recommend fencing and/or alternative ornamental species not palatable to deer) unless to augment other techniques recommended by the authorizing biologist and which are being seriously employed by the landowner.
6. to remove deer as a form of compensation (i.e., DRPs will only be issued at the time of actual depredation).
7. for the use of handguns, muzzleloading rifles, buckshot, crossbows or other archery equipment.
8. to access property other than the complainant's.
9. to discharge a firearm within 300 yards of an inhabited dwelling without first obtaining written permission from the owner or tenant or within city limits unless the complainant can provide a copy of a written waiver (of any ordinances precluding the discharge of a firearm) from city officials/ managers.
10. to live capture and translocate free-ranging deer. An exception would be deer captured under a DPCP authorized by the Forest Wildlife Program.

11. to allow the permittee to keep deer parts other than the meat for personal consumption (i.e., hides and antlers have to be disposed of following the guidelines of the "Illinois Dead Animal Disposal Act").
12. for population control, i.e., issuance of concurrent, successive and/or overlapping DRP's to remove >20 deer within 90 days will require the authorization of the Forest Wildlife Program.

APPENDIX A

ISSUANCE OF DRPs (Removal of ≤ 10 Deer)

At the first opportunity, the Department of Conservation biologist must identify if the land is statutorily huntable, and if so, if the landowner allows firearm or archery hunting. An example of suitable public hunting areas include private land ownership in counties open to firearm deer hunting. In counties that are not open to firearm deer hunting, archery deer hunting should be stressed. In both scenarios, it is imperative that the landowner be encouraged to manage the deer herd on his property. Recommendations, therefore, should encourage the taking of antlerless deer. In addition, it is important to stress that the complainant encourage his neighbors to allow deer hunting.

If the landowner can, but does not allow hunting, a DRP may be issued with the stipulation that beginning with the earliest deer season the landowner will allow and encourage hunting. Furthermore, it must be stipulated that failure to comply with the hunting requirement will preclude the issuance of additional permits beyond the initial year. To document compliance with this requirement, the landowner must maintain records of hunters (name, telephone number, address, and number/sex of deer harvested on his property) and provide this information to the biologist upon request.

PROCEDURE FOR COMPLETING DRPS

1. PROPERTY OWNER/TENANT AND SHOOTER(S): Record the name, address and phone number of the property owner/tenant and shooters. If the property owner does not want to kill deer, he has the option of identifying up to two "specified shooters". Should the landowner be identified as a shooter, he may have only one additional shooter identified to assist him. Inform the landowner that the names of specified shooters will be provided to the county Conservation Police Officer (CPO) to ensure that the specified shooter does not have a violation that would preclude him from legally assisting the landowner. All shooters must have a valid F.O.I.D. CARD and have a copy on his person while attempting to kill, handle, or transport deer.
2. LANDOWNER SPECIFIED AS A SHOOTER: If the landowner or tenant intends to shoot deer, it must be identified in the box alongside his name.
3. LEGAL DESCRIPTION: The DRP must list the TOWNSHIP, RANGE and SECTION along with the COUNTY. At times it will become necessary to identify the area down to the quarter section, i.e., when more than one individual owns land in the same section.
4. REMOVAL METHODS:
 - a. RIFLES: When authorizing the use of rifles it is extremely critical that the safety aspect be addressed, i.e., rifles may be considered as a weapon to dispatch deer if there are no buildings, public/private use areas, or roads associated with the area. The caliber of the rifle must be .243 or larger for DRPs. No rim-fire

rifles will be allowed under the DRP, however, they may be considered a weapon of choice under a DPCP which requires a shooter proficiency test.

- b. SHOTGUNS: The use of shotguns (i.e. 10 through 20 ga.) with slugs is encouraged whenever possible. No DRPs will be issued that allow the use of .410's.
- c. HAZING: Hazing permits (i.e., disturbing deer through the use of cracker shells or plastic slugs) may be issued during and between the firearm season.
- d. SHINING: Shining for the purpose of removing deer with a DRP is defined as follows: Use of artificial light from a moving vehicle while actively attempting to locate deer (not to be interpreted as going to or returning from the area specified on the DRP for deer removal) is legal as long as all weapons are unloaded and legally cased. When shooting while shining, the shooter must be outside the vehicle and have both feet on the ground. Authorized hours for shining are from sunset until 3 hours after sunset, and then 3 hours before sunrise to sunrise. When shining is allowed as an option it does not become effective until 4 days after the initiation of the permit. The purpose of this delay is to provide time for the CPO to be notified.

5. TYPE OF DAMAGE: Usually the type of damage will consist of crops (i.e., corn, soybeans, wheat or alfalfa). Other types of damage include orchard and nursery depredation in the form of "rubbing" and/or "browsing". If the DRP is going to be issued, the extent of damage needs to be recorded as excessive. If no DRP is issued it is necessary to identify that damage is minimal, and then document the rationale for the decision. A suggested location for this documentation is under "Recommendation and Comments" section of the **DEER COMPLAINANT LOG** (i.e., until amount of depredation is appraised as excessive, no removal permit will be issued).

ABATEMENT TECHNIQUES: When meeting with the complainant, whether hunting is a possibility or not, one or more of the following abatement techniques is to be explained, with appropriate handout materials provided to the complainant.

DIRECT:

Regulated Hunting
Sharpshooting (Dept. guidelines)
Trap and Euthanize*
Trap and Transfer*
Fertility Control*
(*Not an option for private landowners)

INDIRECT:

Fences/Movement Barriers
Repellents/Deterrents:
 natural vegetation
 olfactory
 visual
 auditory device
 taste
Habitat Manipulation
Supplemental Feeding
No Action

(A descriptive narrative of each of the above abatement techniques is found in Appendix C)

6. EXTENT OF DAMAGE: Documented extent of damage before a DRP will be issued:

SOYBEANS: DRPs will not be issued when grazing occurs primarily within 5m (15 ft.) of a field edge. DRPs may be justified when 67-100% of the leaves are being eaten from young plants (35-40 days post-emergent) outside the 5 meter border.

CORN: DRPs will not be issued when grazing occurs primarily within 5m (15ft.) of a field edge. DRPs may be justified when $\geq 5\%$ of the plants (in an individual field) are being destroyed outside the 5 meter border. The table below should be useful in assessing economic loss attributed to deer depredation.

TABLE 2. Estimated Corn Yield Reduction Due to Various Amounts of Leaf Removal at Several Stages of Plant Development¹

Percent Leaf Area Destroyed:	10	20	30	40	50	60	70	80	90	100
Stage of Growth	- Percent Reduction in Corn Yield -									
< 5 leaves	0	0	0	0	0	0	0	0	0	0
10 leaf	0	0	2	4	6	8	9	11	14	16
20 leaf	3	5	10	17	26	34	44	56	69	84
Tasseled	3	7	13	21	31	42	55	68	83	100
Silken	2	6	11	19	28	38	50	63	78	95
Milk	1	3	7	12	18	24	32	41	49	59
Dented	0	0	1	3	7	10	14	17	20	24

¹ Taken from table prepared by Hail Insurance Adjustment and Research Association, and Research and Crop Insurance Research Bureau (and reprinted from p.45 of: Deer Damage Committee. 1989. Michigan's deer damage problems: an analysis of the problems with recommendations for future research and communication. Dept. of Fish and Wildlife, Michigan State Univ., East Lansing. 97pp.

NURSERY AND ORCHARD TREES: A DRP may be issued when the authorizing biologist can document damage to 10 percent of a specific species of trees within a nursery or an orchard.

BALED HAY: No DRPs will be issued for depredation to baled hay. Damage to baled hay can be alleviated by centralizing bails and protecting by electric fence.

WILDLIFE FOOD PLOTS: Food plots are planted for the purpose of wildlife. No DRPs will be issued for damage to wildlife food plots. Instead, biologist will explain electric fencing and/or suggest an alternative location for planting the food plot.

ORNAMENTAL PLANTINGS: DRPs will not be issued for browsing and/or rubbing of ornamental plants unless to augment other recommended (by authorizing biologist) techniques already in use. The investigating biologist should describe suitable non-palatable ornamental species and abatement provided through fencing and repellents.

FENCING: No DRPs will be issued for fencing knocked down by deer until the landowner has attempted to alleviate his problem through the installation of colored electric vinyl fencing, or the landowner first uses highly-visible flagging on the section of fence being damaged.

7. PERMIT NUMBER: This section will contain the authorizing biologist's initials and sequential numbering (e.g., JEB001 through JEB010, etc.).
8. TAG NO.: Tag numbers will be recorded in this section by the issuing biologist. Inform permittee that immediately upon collecting and prior to transporting each deer carcass must be tagged (securely through a rear leg)
9. ADDITIONAL REMOVAL SPECIFICATIONS: Under this section the authorizing biologist needs to document additional measures required to be adhered to by the complainant. Examples of such measures may include: the need of the complainant to comply with the Dead Animal Disposal Act when disposing of the non-edible portions of the deer carcass; the need to maintain accurate records for carcass disposition; and any other specific recommendations the biologist believes are appropriate at the time of his field evaluation.
 - a. PERMIT LONGEVITY - NUMBER OF DAYS: Complainants need to resolve their deer depredation problem as soon as possible. Removal permits will not be written for more than 30 days. The biologist may deny a request to renew a permit if the complainant has not attempted to remove the deer within the time frame allowed by the original DRP.
 - b. SEX SPECIFICITY: DRPs issued to control crop damage are to be issued as "antlerless-only" permits. Permits issued to alleviate "rubbing" are to be issued as "antlered-only", with the added requirement that the antlers be destroyed. In a situation where a DRP is issued to reduce rubbing damage, the biologist may issue a percentage of the permits as "antlerless-only", thereby addressing the current concern of rubbing damage while addressing the need to reduce deer densities.
 - c. AGE SPECIFICITY: From a biological and humanitarian point of view, as well as addressing the depredation problem, it is recommended that both females and their fawns be sacrificed.

11. DIVISION OF WILDLIFE RESOURCES: The biologist's name, address, phone number and signature.
12. MANAGEMENT RECOMMENDATIONS: Examples of management recommendations to be recorded here include: hunting, hazing, repellents (both chemical and mechanical) and the requirement to document the number/sex of deer harvested (including the need to record the name, address and phone number of individuals allowed to hunt the previous year).
13. PERMIT PROVISIONS: Provisions in this section need to be identified to the complainant, point-by-point! Explain to the complainant that their name and address (but not phone number) will be provided to individuals contacting the Department requesting names of individuals experiencing deer depredation in a specific county.
14. PERMIT ROUTING PROTOCOL:
 - a. Biologist gives original DRP to complainant (white copy);
 - b. Biologist maintains a file copy of the DRP (pink copy);
 - c. Biologist provides DRP copies to Regional Law Enforcement Office (goldenrod copy) and to the Forest Wildlife Project (photo copy) within two days after issuance;
 - d. Forest Wildlife Project will notify issuing biologist when permit holders are delinquent (≥ 10 days after expiration of permit). Forest Wildlife will provide biologist with delinquent letter that he/she will send to complainant (biologist may elect to use a phone or personal contact to inform the complainant). This contact (letter, phone or personal) will notify the complainant that they must return all materials (appropriate expired permit, unused leg tags and carcass disposition form) to the **issuing biologist**;
 - e. Issuing biologist, upon receipt of the expired DRP, will forward the original DRP and carcass disposition list to the Forest Wildlife Project located in Petersburg within four days.
15. DISPOSITION OF CARCASSES REPORT FORM

Instructions provided for filling out this form (located on the back of the DRP) are self-explanatory.

DEER COMPLAINANT LOG

DATE: _____

Name of Complainant: _____

Address: _____

Phone Number: _____

Referred By: _____

Type of Damage: (plant species, time of year, browsing/grazing/antler rubbing
damage and estimated cost of damage/or replacement value)

Neighboring Land Use: _____

Recommendations: (repellents, fencing, hunting or other abatement techniques)

Action Taken: _____

Recommendation and Comments: _____

Follow up: (date permit returned and number of deer recorded?)

ILLINOIS DEPARTMENT OF CONSERVATION
DEER REMOVAL PERMIT

Permit No. _____

Tag No.(s) _____

PROPERTY OWNER/TENANT

☐ Specified as a Shooter

Name: _____ Birth Date: ____/____/____ Address: _____

City: _____ State: _____ Zip Code: _____ Phone: (____) _____

SPECIFIED SHOOTER (FIRST SHOOTER)

Name: _____ Birth Date: ____/____/____ Address: _____

City: _____ State: _____ Zip Code: _____ Phone: (____) _____

SPECIFIED SHOOTER (SECOND SHOOTER, IF PROPERTY OWNER/TENANT NOT A SHOOTER)

Name: _____ Birth Date: ____/____/____ Address: _____

City: _____ State: _____ Zip Code: _____ Phone: (____) _____

AREA DESCRIPTION

Legal Description: _____

County: _____

Type of Damage: _____

Extent of Damage: _____

REMOVAL SPECIFICATIONS:

The above person(s)/organization(s) is(are) hereby granted a _____ day permit under Section 2.37 of the Illinois Wildlife Code to remove/harass _____ antlerless and/or _____ antlered deer causing property damage. This permit is valid from _____ to _____ and only on the lands owned or rented by the permittee and described above. Unless otherwise specified on this permit and associated document, the permittee and shooters shall follow Chapter 61 of the Illinois revised status and Title 17 of the Administrative Code.

DIVISION OF WILDLIFE RESOURCES
Authorizing Agent

MANAGEMENT RECOMMENDATIONS

Name: _____

Signature: _____

Address: _____

Phone # (____) _____

PERMIT PROVISIONS

1. Removal shall only be by method(s) stated on this permit.
2. No parts or pelts of deer collected under authority of this permit may be sold, mounted, tanned, bartered or traded in any manner.
3. All deer must be tagged through the leg immediately upon kill and before moving. Tags must be retained with the carcass until it is disposed of or prepared for consumption.
4. Permittee must return unused leg tags along with deer removal permit and a completed carcass disposition report form to the Division of Wildlife Resources (address listed above) within 10 days of the expiration of the permit. Additional permits will not be issued until the leg tags and carcass disposition report form is returned.
5. Individuals shooting deer must be specified on the permit and must have the permit on their person while in the process of removing and transporting deer.
6. The Department of Conservation reserves the right to refuse to issue additional permits to permittees who fail to implement management recommendations.

I fully understand the provisions of this permit and also agree to let the Department of Conservation release my name and address to individuals seeking hunting opportunities in my county if I later request an additional permit.

PERMITTEE SIGNATURE: _____

Date: _____

Copies: Original
Yellow
Pink

- Permittee
- Shooter
- Authorizing Agent

Goldenrod
Photocopy
Photocopy

- Law Enforcement
- Forest Wildlife Program
- District Wildlife Manager

DISPOSITION OF CARCASSES REPORT FORM

PERMITTEE NAME: _____ PERMIT NO.: _____

Permittee is required to record the date, age (adult/fawn), sex (male/female), tag number and disposition of each deer.

Date Taken	Age (A/F)	Sex (M/F)	Tag Number	Disposition (if given to another person, provide name, address & phone number)
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				

PLEASE NOTE: The permittee must return the above report and all unused leg tags to the Authorizing Agent within 10 days of the expiration of the permit (Illinois State Statute 61§2.37).

APPENDIX B

Deer Population Control Permit

The Department strives to maintain deer densities at desirable levels or to adjust them in accordance with biological and/or social needs. Management alternatives to achieve this objective include: manipulation of the size and sex composition of the harvest, season type, season timing, season length and the number and/or types of permits issued. However, in areas where hunting is precluded due to concerns for human safety and/or precluded by federal, state, county or municipal statutes or ordinances deer population control permits may be issued under the following guidelines.

DPCP PROCEDURES/GUIDELINES

- A) DPCPs are the only "non-hunting" deer permits issued for deer population/herd reduction and control.
- B) These permits are issued to land-managing or landowner agencies, organizations, corporations, associations, etc. and are not to be issued to individual private landowners. Examples of land-managing/landowner organizations/agencies (hereafter referred to as "land-managers") include, but are not limited to:
 - county forest preserve districts
 - county conservation districts
 - county or municipal park districts
 - airport authorities
 - municipalities
 - golf courses/country clubs
 - cemeteries
 - homeowner associations
 - girl/boy scout camps (or other outdoor recreational/educational camps)
 - open space/open lands associations
 - Federal installations (military bases/facilities, Nat'l labs, etc.)
 - colleges, universities, or other schools
 - corporate and industrial developments
- C) Upon initial contact by a representative of landowner, Division field staff (DWM's and PLB's) will follow procedures similar to those outlined for DRP requests by private landowners:
 - 1) The Division "agent" should record pertinent information, and maintain this information on file, during the initial contact. Information to be recorded includes: land-manager's (agency/organization) name, address, phone number, the representative's name and phone number, size/acreage of property, description of deer-related "problem", whether the property in question is within city limits (i.e., whether it is incorporated or unincorporated property), and whether the property is statutorily (and currently, or potentially, huntable).

- 2) Set up an site-inspection/evaluation for the earliest, mutually agreed upon, convenient date.
- 3) Review, during the initial contact, later contact, or site-inspection, the steps the land-manager must follow in order to receive a DPCP. The agency, corporation or association requesting authority to remove deer must develop and submit a management proposal to the biologist before a removal permit will be granted. The minimum requirements for a DPCP proposal are:
 - a. A TITLE PAGE - with the name, address and phone number of the organization submitting the proposal and date submitted.
 - b. INTRODUCTION AND PROBLEM STATEMENT - which includes a brief description of the size, location and objective statement for the area to be managed.
 - c. PROGRAM GOALS - which addresses the long term purpose of the management, i.e., the damage to be alleviated.
 - d. PROGRAM OBJECTIVES - which provides specific descriptions of management tasks to be accomplished, i.e., desired deer densities to be achieved by what methods, etc.
 - e. SITE DESCRIPTION - which includes a detailed description of the area, evaluation of deer numbers, and an outline of past deer management activities.
 - f. DOCUMENTATION OF THE PROBLEM - which includes extent and distribution of native species, ornamental and/or agricultural plants that are being damaged or destroyed, along with replacement costs.
 - g. PROPOSED METHODS AND PROCEDURES - which identifies the techniques to be used and the number of animals to be removed (The cost of deer removal program and carcass processing fees are the responsibility of the landowner that implements the management program and needs to be identified during the planning phase).
 - h. EVALUATION OF MANAGEMENT PROGRAM - which lists the criteria that will be used to evaluate the effectiveness of the techniques in meeting the stated objectives.
 - i. CHRONOLOGY OF MANAGEMENT ACTIVITIES - which includes date of the proposal, date of initiation, completion date, evaluation of results and the date the summary is to be returned to the Department.
 - j. LITERATURE CITED
 - k. TABLES, GRAPHS AND APPENDICES that support the proposal.
- D) Deer management proposals/applications for DPCP will be required annually. Proposals must be submitted no later than 30 days prior to the proposed

starting date in order to allow ample time for review by PLB or DWM and Forest Wildlife staff, for sharpshooter certification, etc.

E) DPCP routing procedures:

- 1) Division field personnel (PLB or DWM) receive, and provide initial review of, the deer management proposal/DPCP application. This review process may entail returning the proposal to the land-manager for more information and/or clarification.
- 2) When satisfied, the PLB or DWM will forward the proposal and his/her recommendations/comments to the Forest Wildlife Program (Program Manager and both the Forest Wildlife Project in Petersburg and Urban Deer Project in Elgin). The PLB's or DWM's comments should contain approval (based on site-evaluation) of proposed bait/shooting sites and the charity(ies) to receive processed venison or field-dressed carcasses.
- 3) If approved, a DPCP will be issued by Forest Wildlife and copies will be distributed per instructions on the bottom of the permit with a copy (xerox) forwarded to the PLB or DWM.
- 4) Upon issuance of the DPCP and prior to any deer removals via sharpshooters, the Division field agent should schedule time and place for sharpshooter certification/shooting proficiency test.

F) Summaries required are:

- 1) Within 30 days of permit expiration, or collecting the total number of deer authorized, the land-manager must submit a complete deer removal record and carcass disposition report to the authorizing agent (along with any unused carcass tags) and the initial Division staff contact. This summary must contain the date collected, carcass tag number, sex and age, weight (not mandatory), condition index (not mandatory), presence of wounds, abnormalities, and/or parasites, and ultimate disposition for each deer. The summary should also contain either the number of deer carcasses or the amount of processed venison donated to charity.

If the permittee is issued another/successive DPCP in order to extend the time for removals or increase the number of deer to be removed (which requires additional written justification), the removal/carcass summary must be submitted within 30 days after expiration of the last permit issued. Deer removal activities are generally conducted during late fall-winter which means that no more than 2 - 90 day DPCP will be required. A DPCP can be issued for any number of deer, but like all nuisance wildlife removal permits is restricted by provisions in the Illinois Wildlife Code to be valid for no more than 90 days.

Until recently land-managers were required (by the legal interpretation of the Good Samaritan Food Donor Act and an agreement between IDOC, IDOPH and IDOA), to have deer carcasses inspected and then processed in a state-licensed facility before donation to charity. Since the Good Samaritan Food Donor Act was recently amended (effective 1 January 1993) to allow donation

of field-dressed carcasses, details on handling, transportation, processing and inspection of the carcasses will be per guidelines approved by the Departments of Conservation, Public Health and Agriculture during summer-fall 1992.

- 2) Within one year of DPCP expiration, or as part of a subsequent management proposal/DPCP application, the permittee must submit a summary/evaluation of the effects and/or effectiveness of the deer removal program, based upon stated program objectives and methods of evaluation.

Since white-tailed deer are considered to be State property, the Forest Wildlife Program will need to provide a summary of the number of deer removed via DPCP and donated to charities to Department of Central Management Services.

- G) The role of Division personnel in deer herd reduction programs implemented by non-State land-managers is providing assistance and recommendations and overseeing/monitoring removal activities. Division personnel may provide assistance in the field (e.g., serving as an observer on aerial or spotlight counts, assisting with vegetation measurements, etc.) as possible, but this does not include making arrangements for, or conducting, aerial surveys for the land-manager. The land-manager is responsible for making all arrangements associated with proposal and summary preparation, deer removals, carcass disposition, and program evaluation and will be responsible for all costs incurred.

ADDITIONAL DPCP SPECIFICATIONS:

Only field-proven effective deer population control techniques will be approved and authorized.

Any chemical introduced by any means into free-ranging white-tailed deer for the purpose of population control must be approved by the United States Food and Drug Administration and United States Department of Agriculture for use on free-ranging and/or food producing animals. Additionally, any such drug must have been shown, through published scientific research, to have no harmful effects upon predators (including humans) and scavengers feeding upon the flesh of an animal treated with said drug.

Live capture, translocation and release of wild white-tailed deer into a free-ranging situation, as a method of population control, will not be permitted.

Live-trapping and relocation of deer will be permitted only to not-for-profit zoological institutions approved by the Department and subject to the following conditions:

1. Individual deer must be certified by a licensed veterinarian as "disease free" before translocation may occur. Specific tests required are based on current IDOC, IDOA and IDOPH guidelines;

2. Translocation and handling of deer must be conducted under the direct supervision of a professional wildlife biologist or licensed veterinarian;
3. Translocation of deer will only be allowed to zoological institutions having deer-proof enclosures to prevent escape into the wild.
4. If deer are to be moved across state lines, permits must be obtained from the natural resource agency in that state; copies must be provided to the Forest Wildlife Program;
5. All deer treated with drugs (e.g., immobilizing agents) and released into a free-ranging situation must be permanently marked in a highly visible manner; and
6. Individuals actively involved in live-trapping and translocation must carry a copy of the DPCP and carcass tags at all times when moving and handling deer. Should mortality occur during translocation, a carcass tag must be immediately affixed to the deer carcass through a rear leg.

Live-capture and translocation of free-ranging deer to privately-owned commercial game breeding facilities, as a method of controlling deer numbers, will not be permitted.

Live-capture and euthanasia will be permitted only if method of euthanasia is deemed acceptable and/or humane by the most recent American Veterinary Medical Association Panel on Humane Euthanasia and does not render carcasses unsuitable for human consumption.

Selective shooting by professional sharpshooters, tested and approved by the Department authorizing biologist, using techniques that maximize both human safety and humane treatment of animals will be permitted.

Deer collected by approved lethal means must be handled (i.e., field-dressed, cooled, processed and donated) per current IDOC, IDOA and IDOPH guidelines. Unless otherwise specified, any carcasses unsuited for human consumption must be disposed of via guidelines in the Illinois Dead Animal Disposal Act.

ILLINOIS DEPARTMENT OF CONSERVATION
DEER POPULATION CONTROL PERMIT

Permit No. _____
Tag No.s _____

PROPERTY OWNER/MANAGER

Agency/organization name: _____
Address: _____
City: _____ Zip Code: _____
Agency/organization contact person(s)/representative(s):
Name: _____ Phone number: (____) _____
Name: _____ Phone number: (____) _____

AREA DESCRIPTION

Legal description of property: _____

Acreage: _____ County: _____ Type and extent of damage: _____

REMOVAL, AND CARCASS DISPOSITION, SPECIFICATIONS

The above agency/organization is hereby granted a _____ day permit under Section 2.37 of the Illinois Wildlife Code to remove/harass _____ antlerless and/or _____ antlered deer causing damage (described above). This permit is valid from ____/____/____ to ____/____/____ (dates inclusive) and only on the lands owned/managed by the permittee and described above. Unless otherwise specified on this permit, or associated cover letter and/or document(s), the permittee and certified sharpshooters shall adhere to the provisions of Chapter 61 of the Illinois Revised Statutes and Title 17 of the Illinois Administrative Code.

PERMIT PROVISIONS

1. Proposed sharpshooters must be tested and certified by Department of Conservation-Division of Wildlife Resources personnel. Names, addresses, phone numbers, and other pertinent information, of the certified sharpshooters will be maintained on file by the Authorizing Biologist. Sharpshooters must carry a copy of this permit on their person at all times when collecting, transporting, and/or handling deer.
2. Removal shall only be by the method(s) stated on this permit.
3. No parts or pelts of deer collected under authority of this permit may be sold, mounted, tanned, bartered, nor traded in any manner.
4. All deer must be tagged (through a rear leg) immediately after killed and before transporting. Tags must be retained with the carcass until it is disposed of or prepared for consumption.
5. Permittee must return any unused leg tags along with this permit and a complete removal record and carcass disposition report to the Authorizing Biologist within 30 days of the expiration of this permit. A complete evaluation of the effectiveness of the removals, authorized herein, in reducing/eliminating the aforementioned, deer-related damage must be submitted within 1 year of the expiration of this permit or with any subsequent permit requests/management proposals; this does not apply to a permit extension during the current removal program.
6. The Department of Conservation reserves the right to refuse to issue additional permits to permittees who fail to implement management recommendations (as provided by DOC) or do not provide the required summaries.

MANAGEMENT RECOMMENDATIONS

I fully understand the permit provisions, specified methods of removal and carcass disposition, summaries required, and management recommendations, listed herein, and agree to abide by them.

PERMITTEE/REPRESENTATIVE SIGNATURE: _____ DATE: _____

FOREST WILDLIFE PROGRAM AUTHORIZING AGENT:

Name: _____ Signature: _____
Address: _____ Phone number: (____) _____

Copies: Original - Permittee

- Copy 1 - Authorizing Agent (Forest Wildlife Program)
- Copy 2 - Regional Law Enforcement Commander
- Copy 3 - Regional Wildlife Administrator

APPENDIX C

SHARPSHOOTER CERTIFICATION/TESTING PROCEDURES

In order to insure human safety and humane euthanasia, agencies implementing deer herd reduction/control programs using professional sharpshooters must make arrangements to have the individuals, proposed as sharpshooters, tested/certified annually by appropriate Illinois Department of Conservation (IDOC)-Division of Wildlife Resources (DWR) personnel. ALL other aspects of these programs (e.g., shooting/bait sites, meat processing facilities, carcass inspectors, charities to receive processed venison, etc.) must be approved by the IDOC-DWR authorizing biologist and the Forest Wildlife Project. The sharpshooter certification process entails essentially 3 steps, listed in detail below:

- 1) Application: proposed sharpshooters must complete pertinent sections (highlighted) of a standard "Marksmanship Certification" form (attached). Applicants are permitted to use the back of the form or an additional sheet of paper if they require additional space for listing experience. The latter section should be filled out as completely as possible by the applicant since experience is of great importance when evaluating the qualifications of the applicant. Experience that should be listed includes: firearm or hunter safety courses taken or taught by applicant, shooting clinics or competitions, training in use of firearms during military or police service, other marksmanship tests taken, type (and number of years) of hunting experience, etc. Applicant should indicate date, or age at the time, of completing hunter safety course, shooting competition, etc.
- 2) Shooting Proficiency Test: The proficiency test is designed to insure that the proposed sharpshooter can consistently, accurately, and precisely hit a target similar in size to the one he/she will see in the field. This test is administered at a 50 yard outdoor range. Applicants are allowed to use a bench rest since this simulates field conditions; unfortunately use of a public range for the test precludes shooting from an elevated position or at night with a spotlight which are also field conditions. The applicant must use the firearm and ammunition that he/she will be using in the field during the removal program. All firearms must have telescopic sights (i.e., scopes). The type of weapon to be used dictates the target size to be used for the test, number of shots to be taken, and acceptable score:
 - a) For all rifles, the test target is the "National Rifle Association (NRA) official 50-yard small bore rifle target" with 5 bullseyes. On the official test target which the applicant has signed and dated prior to attaching to the target backstops/holders, the applicant will discharge one round at each bullseye for a total of 5 shots. For centerfire rifles ($\geq .2188$ cal.), the cutoff for certification is 45 out of a possible total of 50 points; the applicant must consistently place all shots within the "9-ring" which has a diameter of approximately 1.9 inches.

- b) As of the winter of 1992-93, for rimfire rifles $\leq .22$ magnum caliber, all criteria in "a" above apply except the point cutoff for certification will be 46 out of 50 points possible.
- c) For 1 2-20 gauge shotguns with slugs, the target used for proficiency testing is the "NRA official 50-yard slow fire pistol target" with one bullseye. The applicant will discharge 3 rounds at the single bullseye. Cutoff for certification is 27 out of a possible 30 points; the applicant must be able to group three shots within a circle of 5.5 inches in diameter.

There is no time limit on the shooting proficiency test but the applicant is allowed only one attempt to certify per winter/removal season. For example, the agency or organization implementing the deer management program must inform the IDOC of potential sharpshooters to be tested. Next the shooting proficiency test will be administered by the IDOC no greater than 45 days prior to the proposed date for initiation/implementation of the management program. The potential sharpshooters are allowed one attempt to qualify, and if unable to do so, they cannot be retested until the following year.

Potential sharpshooters are expected to familiarize themselves with, and to follow, all rules of the firearm range used for the proficiency test. The applicant's knowledge of his/her firearm and ability to safely handle a firearm will be evaluated during the proficiency test.

- 3) Oral Interview: potential/proposed sharpshooters will participate in an oral interview before, at the time of, or after, the shooting proficiency test; the interview will be conducted in person or via telephone. The number and types of questions are dictated by previous knowledge of, and familiarity with, the sharpshooter and his/her abilities, prior shooting and/or hunting (especially deer) experience, firearm training, previous participation in deer management programs as a sharpshooter, etc. The oral interview allows IDOC personnel to: clarify any unclear or vague information listed on Marksmanship Certification form (e.g., experience); assess the applicant's knowledge of deer anatomy, biology, and behavior; assess the individual's motivation for wanting to be a sharpshooter; evaluate the applicant's knowledge of the proposed deer management program and program priorities; develop an initial impression of the individual's attitude toward the program, cooperativeness, and commitment to insuring human safety and program success.

Additional Requirements:

- 1) Must be ≥ 18 years of age.
- 2) If a resident of Illinois, must possess a valid FOID card and hunting privileges must not have been revoked.
- 3) If convicted of any violent felony or Wildlife Code violation, must have had FOID card and hunting privileges reinstated.
- 4) If not a resident of Illinois, cannot have been convicted for any felony or Game Code violations.

NOTE: Although a sharpshooter candidate may initially be certified/approved by the IDOC after fulfilling the above requirements, tests, and interviews, his/her certification as a sharpshooter is tentative and is continually evaluated (by the IDOC and the agency implementing the deer management program) during the course of the program. Any disregard for human safety, incidence of a high deer wounding rate, uncooperativeness or poor attitude, and/or other problems will result in the immediate revocation of the individual's certification as a sharpshooter.

APPENDIX D

SUMMARY OF DEER POPULATION CONTROL/DAMAGE ABATEMENT TECHNIQUES

A) Nonlethal Population Control

1) Passive/nonintervention: in other words, "let Nature take its course" with the hope that excess deer numbers and associated damage are due to a temporary disturbance/distribution of deer and/or that deer numbers will become self-limiting.

PRO's: Although this constitutes conscious inaction or avoidance, it is very acceptable to some segments of the urban/suburban public; inexpensive to implement although subsequent deer-related damage may entail considerable financial loss by landowners, farmers, nurserymen, or orchardists and/or irreversible damage to native ecosystems.

CON's: Although deer numbers may be limited during the winter by availability of refugia (and associated food and cover) in rural areas, agricultural crops would be decimated during the growing season. On natural areas, native plant and animal species diversity would be greatly reduced long before deer numbers became self-limiting. Concisely, this means allowing deer numbers to increase to the point where mortality due to starvation/malnutrition and dispersal offset reproduction.

EXAMPLES: Boulder, CO and to date, the National Park Service.

2) Habitat modification: a) restoration of native vegetation/food supply on degraded natural areas (via planting, seeding, fertilizing, prescribed burning, removal of competing exotic/introduced plant species, etc.), b) provide plantings specifically as deer food (which essentially equates to supplemental feeding), and c) the other end of the spectrum, removal or reduction of available deer habitat (Brush and Ehrenfeld 1990).

PRO's: a) acceptable to some segments of public as well as ecologists involved in ecosystem enhancement/restoration, b) supplemental feeding is supported by individuals opposing lethal removals; may divert attention of deer from crops or desirable species, and c) reduces number of deer on site as they are forced to disperse/forage elsewhere.

CON's: a) involves commitment of considerable funds and labor and may be futile if deer numbers are high; new plants will be eaten as soon as they sprout or are planted, b) providing additional food for deer will maintain the animals in better (reproductive) condition, which in turn leads to more deer in subsequent years; this technique may actively "draw" deer into the area, c) causing deer to disperse by reducing the suitability of their habitat would essentially chase the problem onto adjacent properties. Habitat modification techniques alone will not deter deer damage over time but in conjunction with a herd reduction and maintenance program would be beneficial.

3) Supplemental (or intercept) feeding: providing food for deer in attempts to satiate them or divert them from crops, nurseries, ornamental plantings, roads, etc.

PRO's: Highly acceptable to some; may temporarily achieve reduction of deer damage. A research study (Wood and Wolfe 1988) in Utah during 1985-86 indicated that deer-vehicle collisions may be temporarily reduced by "short-stopping" deer with supplemental food (i.e., intercept feeding), but the researchers concluded that this technique was not feasible as a long-term alternative.

CON's: Briefly discussed under habitat modification above; since food is a limiting factor in unhunted, or under-hunted, areas, putting out additional food allows more animals to survive through the winter than the normal forage available would allow; feeding would have to be continued indefinitely in order to support the artificially high population of healthier, highly reproductive animals. Studies have shown that deer will continue to utilize other available food sources even when supplementally fed--damage may be reduced, but not eliminated--as feeding stations are used by dominant animals at the exclusion of subordinates (Schmitz 1990). Feeding may concentrate animals which can hasten the spread of any disease or parasite; feeding may actively draw deer across roadways which raises concerns for human safety. A quick change in a deer's diet (e.g., high carbohydrate supplemental foods during a severe winter) can be more detrimental than beneficial; lactic acidosis, rumenitis, rumen impaction, and even death may result (Wobeser and Runge 1975, Verme and Ullrey 1984).

4) Live capture and translocation: deer are captured via box traps, corral traps, drive nets, drop nets, rocket nets, remote chemical immobilization/darting, etc. and moved to suitable release site.

PRO's: Highly acceptable to the public and quite often first alternative advocated by those opposing lethal techniques. According to the latter individuals, this technique provides individual animals with a chance for survival. Initially, deer at high densities can be easily baited into capture sites and numerous animals can be caught. Some animals do survive capture/translocation and remain on (or near if in a free-ranging or free-release situation) the release site.

CON's: Numerous variations of this technique have been used in the past and nationwide (Jones and Witham 1990). Mortality tends to be high (>50%) among deer translocated from high density herds; mortality factors among urban/suburban deer free-released in rural areas include stress associated with handling during capture and translocation (i.e., capture myopathy or exertional rhabdomyolysis), deer-vehicle accidents (translocated deer are initially ignorant of location of roadways at release site), and hunter harvest (deer from unhunted urban areas have generally habituated to the presence of humans). Costs are high, but tend to be site-and program-specific and can range roughly anywhere from \$200 - \$1400 per deer moved. As deer numbers are reduced and/or deer become wary of capture/bait stations, trapping success declines markedly and attaining desired herd reductions becomes impractical, if not impossible; one is hard-pressed to find a deer management program where herd reduction objectives were achieved by translocation alone. With the widespread distribution and increasing numbers of whitetails throughout Illinois and the Midwest, the potential impacts (e.g.,

spread of disease or parasites, competition for available resources) upon resident deer at the release site must be considered. These factors have led to current Department of Conservation guidelines which restrict translocation of free-ranging "urban" whitetails to not-for-profit zoological institutions.

EXAMPLES (of local translocation programs): Busse Woods, Cook County Forest Preserve District, near Elk Grove Village, IL; Ryerson Conservation Area, Lake County Forest Preserve District, near Lincolnshire, IL; Schlitz Audubon Center, Milwaukee, WI; Village of River Hills, WI; University of Wisconsin-Madison Arboretum, Madison, WI; University of Indiana/Purdue campus, Fort Wayne, IN.

5) Reproductive intervention: techniques suggested/attempted range from mechanical/surgical sterilization (performing vasectomies on bucks and ovariectomies/tubal ligations on does; e.g., Matschke 1976) to chemical reproductive inhibitors (e.g., melengestrol acetate, MGA, or diethylstilbestrol, DES) administered via treated bait/food, injection, darting, or surgical implants (Bell and Peterle 1975, Botti 1985, Matschke 1977 & 1980, Roughton 1979). More recently, attention has focused on immunocontraceptives delivered via darts; a porcine zona pellucida (PZP) vaccine, administered via a series of 2-3 injections (darts), successfully inhibited foaling by semi-tame horses on Assateague Island National Seashore in Maryland (Kirkpatrick et al 1990) and apparently shows promise for use on captive whitetails. In a slightly different vein, Columbus Metro Parks used prostaglandin, which causes abortion of fetuses, to stabilize deer numbers on a 762 acre city park and evaluated the technique over 3 years: 1989-1992 (Stanley and Jones, no date); they are currently looking into alternative population reduction techniques.

PRO's: Popular among individuals opposing any lethal means of controlling/reducing deer numbers. Unlike other techniques listed thus far, sterilization eliminates the treated individual from the "reproductive pool" for a period of years, thereby reducing overall reproductive potential of a localized herd and reducing the rate of herd growth.

CON's: (McCullough 1988) a) steroidal contraceptives (e.g., MGA and DES) are effective in preventing pregnancy, and surgical implants may be effective for 5-7 years. Such implants require the live capture and handling of each individual (specifically females) to be treated; therefore, this technique falls under the same constraints as live capture and translocation in that herd reduction goals would be, at best, very difficult to achieve due to the law of diminishing returns. Additionally, the persistence of these steroid compounds in the deer's body and the potential impact upon animals (including humans) ingesting a treated carcass are of concern, b) administering any chemical via treated bait/food is totally unacceptable due to risks to "non-target" species and the inability to control dosage received by the "target" species, c) use of immunocontraceptives is still very much in the research stage which precludes their use upon free-ranging, wild whitetails as population control technique at this time, d) the questions remain as to whether enough animals can be treated/captured to offset reproduction, how long will herd reduction via natural attrition take even if enough animals can be treated, and whether U.S. Food and Drug Administration approval for use of these experimental drugs on free-ranging wild animals can be obtained.

Additionally, in the study of immunocontraceptives on semi-tame horses in Maryland, 3 horses were eliminated from evaluations because they became too wary to be darted a second time. The PZP vaccine was effective in preventing pregnancies for 1-2 years which means that female whitetails that can live >6.5 years on the average in unhunted refuges (Nixon et al 1991) would have to be darted several times during their lifetime. Current research has focused on microencapsulation of the PZP compound and development of a "one-dart dose".

6) Driving deer from impacted area:

PRO's: May quickly, and relatively inexpensively (especially if large numbers of volunteers are available) alleviate localized problem of excessive deer numbers. This technique was used to control deer numbers in an enclosure in Virginia (Wemmer and Stuwe 1985).

CON's: Probably feasible in small enclosures only; not a viable alternative for reducing numbers of free-ranging deer due to concerns for human safety if deer are accidentally driven across roadways, inability to drive deer especially in certain vegetation cover types (i.e., brushy areas), and the fact that the deer "problem" is just being pushed elsewhere and can return if not immediately fenced out.

B) Nonlethal Damage Abatement (see Appendix A):

1) Repellents and Deterrents: this rather broad category includes a) commercial and home remedy olfactory and taste repellents (listed below) that must be applied regularly to protect individual plants or crops (Andelt et al 1991, PA Coop. Ext. Serv. 1985, Harris et al 1983, Hygnstrom and Craven 1988, Palmer et al 1983), b) auditory scare devices such as 12 gauge shell crackers, propane cannons/exploders, clappers, and other noise-makers, c) visual scare devices such as scarecrows or flashing lights, d) rubber deterrent ammunition, which is designed to inflict pain (but not kill or injure), used in conjunction with an auditory deterrent, e) dogs, f) reflectors along roadways, which form an optical barrier along the roadside when struck by car headlights, to reduce deer-vehicle accidents (DVA's), and g) high frequency "deer whistles" mounted on vehicles to prevent DVA's.

REPELLENTS

COMMERCIAL

Anipel Tablets (taste - patent pending)
Deer Away/Big Game Repellent (odor & taste)
Hinder (odor repellent)
Magic Circle Deer Repellent (odor)
Miller Hot Sauce (taste repellent)
Ro-pel (taste repellent)
Thiram (taste repellent)-sold under
several different brand names

HOME REMEDY

Bars of soap
Blood meal
Bone meal
Feather meal
Milorganite
Moth balls
Predator feces or urine
Rotten eggs or mixture of
whole eggs(>20%) in water
Tankage (putrefied meat
scraps)

PRO's: a) repellents may be cost-effective in controlling deer browsing damage to ornamental plants, gardens, nursery and orchard stock, and specialty crops (Swihart and Conover 1990, Conover 1987) especially if used in combination with other damage abatement techniques. Additionally, they can be used during that time of year when damage occurs thereby precluding damage abatement costs during certain times of the year, b-e) auditory and visual scare devices if used continuously at the first sign of deer damage may prevent deer from establishing a travel pattern to the area to be protected and divert them to other available food sources, f-g) evidence on the effectiveness of Swareflex reflectors and Bosch "dancing light" mirrors along roadways, lighting of roadways, and deer whistles mounted on vehicles in preventing DVA's appears somewhat anecdotal; many variables can cause changes in deer-vehicle accident patterns which confounds results of research projects attempting to evaluate the effectiveness of these deterrents. However, summaries of the use of Swareflex reflectors indicate reductions in the number of DVA's along major highways (Ingebrigtsen and Ludwig 1986, Schafer and Penland 1985, Schellhaass-no date).

CON's: Effectiveness of repellents and deterrents is highly contingent upon deer densities, travel and feeding patterns, availability of other foods, and other damage abatement techniques being used. Commercial repellents can be quite costly (e.g., an 8-ounce container of Big Game Repellent powder sells locally for around \$15; this quantity will reportedly cover <250 conifer seedlings or <37 4 ft. high ornamental shrubs), must be applied prior to anticipated deer damage and deer establishing travel patterns to the plants/crops to be protected, and must be reapplied throughout growing season (i.e., new sprouts will essentially outgrow the "protection" of repellent already applied) and after heavy rainfall. Additionally, use of repellents alone in an area with large numbers of deer, limited natural foods, and established deer travel lanes may be futile; if alternate food sources are not available deer will eat what is available regardless of smell/taste. Additionally, taste/contact repellents are probably ineffective in preventing antler-rubbing damage; olfactory/area repellents may have some preventative impact if applied during the fall.

White-tailed deer are very adaptable creatures and habituate very quickly to manmade disturbances/noises (thus their success in urban-suburban areas); therefore, auditory or visual deterrents are of limited long-term effectiveness. Deterrents may temporarily cause deer to avoid a given area, especially if they are used prior to deer establishing travel lanes to the area, are set to go off at irregular intervals, and are moved to a new location from time to time. The "jury is still out" (as research continues) on the short- and long-term effectiveness of reflectors/mirrors along highways and high frequency whistles on cars in preventing/reducing DVA's.

2) Exclusion: includes electric and nonelectric fences, netting, cages or cylinders around individual plants. Types of electric, as well as nonelectric, fences varying considerably (see Byrne 1989, Ellingwood et al 1985, Ellingwood and McAninch 1984, Hygnstrom and Craven 1988, Palmer et al 1985, Porter 1983, Myers and Muller 1990, Tierson 1969, Wegner 1984). Nonelectric perimeter fences have to be >8 ft. high with no gaps under, or through the fence, to be considered "deerproof"; however, fences as low as 4 ft. around small garden plots can be very effective.

Electric fences range from multiple strands of high tensile wire mounted on vertical or slanted posts (Selder and McAninch 1987) to a single strand of "hot tape" (also called Visible Grazing System (VGS), Turbo Tape, Poly Tape) erected on fiberglass or plastic poles seasonally/temporarily prior to anticipated damage. Accordingly, types of electric fence chargers vary to meet various fence applications; solar-charged 12-volt units are available for permanent fences or remote areas, regular 12-volt or 110-volt units are available, and small temporary units powered by 6 D-cell batteries (and generating up to 7400 volts) are sold commercially. Types of netting or fencing to protect individual plants or small gardens are too numerous to describe completely herein. Studies have also been conducted on fencing to deter deer-vehicle accidents (Bashore and Bellis 1982, Falk et al 1978, Ludwig and Bremicker 1981).

PRO's: Probably the most effective nonlethal means of reducing, if not eliminating, deer damage and very cost effective if used to protect rare/endangered plants, expensive ornamentals, nurseries and orchards, or specialty crops. Fences can be designed to deter multiple "nuisance" species simultaneously; selection of fence type (and cost) can be suited to site-specific conditions.

CON's: Costs for purchase, construction, and maintenance probably preclude exclusion as a means of reducing damage on large areas (especially if a fence would block established deer travel lanes), agricultural/row crops, or natural areas. In any case, a cost:benefit analysis by the landowner would be advisable. This technique does not address a local or regional problem of excessive deer numbers and essentially fences deer onto adjacent properties.

3) Utilize plant species avoided/not browsed by deer: probably most applicable for the selection of ornamentals by homeowners. Residential areas in, or adjacent to, deer habitat (e.g., woods and/or vegetated travel lanes such as waterways, utility or railroad rights-of-way) can essentially become part of the deer's habitat. The adaptable nature of deer, the presence of very palatable plants throughout the year, and the degradation of adjacent natural areas or

decrease in availability of plants that deer normally browse, leads to habituation to using ornamentals and establishment of travel lanes by deer. Several lists of plants preferred and avoided by deer have been published (Conover and Kania 1988, Cox-no date, Cummings et al 1963, Feeney 1946, Matthews and Glasgow 1981); such a list has been compiled for northeastern Illinois (Appendix E). However, white-tailed deer are very selective feeders and tend to browse the most nutritious plants (or stages and parts of plants). Whether a plant is palatable to, or preferred by, deer is dictated in part by nutrient content (which in turn is dictated by soil parameters), availability of this plant, and availability of other food sources. Therefore, the same plant species may be more heavily browsed in one area than another.

PRO's: By not providing a steady food source for deer, travel routes to the property may not develop as deer forage elsewhere for more palatable plants.

CON's: In areas of high deer densities, especially those with the loss or degradation of normal browse species, probably very few plants are immune from being browsed/damaged by hungry deer.

C) Lethal Population Reduction

1) Hunting: This is the legal harvest of deer under season constraints and harvest quotas established by the Illinois Department of Conservation via the Administrative Rule process. Deer hunting in Illinois was first opened in 1957 in 33 counties. By 1975, firearm hunting for deer was allowed in all counties except 4 in northeastern Illinois (i.e., Cook, DuPage, Kane, and Lake); all 102 counties are open to archery hunting for deer.

PRO's: Very popular among certain segments of the public. Realistically, this is the only means of effectively controlling deer numbers over large areas. Harvest strategies are flexible and can be altered to reduce, maintain, or increase deer numbers on a regional (e.g., county), or a very localized (e.g., nature preserve and State parks), basis. Strictly regulated and closely monitored hunting programs have been used very successfully nationwide in controlling/reducing deer numbers and thereby reducing associated damage, even in metropolitan areas.

CON's: Opposed by certain segments of the public (e.g., Heintzelman 1988); hunting may not be practical in some urban or suburban areas primarily due to concerns for human safety (e.g., proximity of residences or roadways), but also potential conflicts with other park/preserve users. The unwillingness of some hunters to harvest females/does hinders attempts of wildlife managers to control herd growth and stabilize numbers at a level precluding extensive damage to natural and planted vegetation alike.

EXAMPLES (of hunting programs to control localized deer herds):

Locally = Rock Cut State Park, Rockford, IL; Nationwide = Yale-Myers forest in NE Connecticut; Crane Beach Memorial Reservation, Ipswich, Massachusetts; Carey Arboretum/New York Botanical Garden, Millbrook, New York; West Point Military Academy, West Point, New York; Minnesota Valley National Wildlife Refuge,

adjacent Fort Snelling State Park, and adjacent county parks, Minneapolis-St. Paul, Minnesota.

2) Selective removal by sharpshooters: This technique uses certified marksmen to remove a specified number of deer from an area with emphasis placed on the removal of females/does in order to reduce the reproductive capacity and growth rate of a localized deer herd. Sharpshooting, alone or in conjunction with other techniques (e.g., closely regulated hunter harvest), has been used successfully to control/reduce deer numbers on several sites nationwide and in northern Illinois. Current Illinois Department of Conservation guidelines on sharpshooting by land managing agencies (e.g., county forest preserve districts, arboretae, villages) place paramount importance on insuring human safety and humane treatment of animals and specify that deer carcasses be inspected, processed, and donated to not-for-profit charitable organizations.

PRO's: Seems to be acceptable to most members of the public, yet some oppose any lethal method of reducing deer numbers. This technique can be geared to achieve site-specific deer management goals due to the greater ability to remove a specific number, and sex or age class, of deer. Sharpshooting can be, and has been, used very safely and effectively in suburban/urban areas where hunting is not allowed, practical, or acceptable.

CON's: Due to costs (e.g., bait, elevated blinds, spotlights, sharpshooters, if hired from outside, and particularly carcass processing costs) and the labor-intensive effort required, sharpshooting is best suited for controlling deer numbers on small, localized/well-defined areas; this technique is not suitable for reducing or maintaining deer numbers on a large scale, such as a county-wide basis. Deer are "baited" in to safe shooting sites to insure human safety. In this respect, removal rates via sharpshooting are under constraints somewhat similar to those for live capture in that deer become more difficult to bait to a site as their numbers decrease and those that remain become more wary. However, this problem can be partially overcome by establishing bait sites in new locations; deer may be baited to shooting sites more readily because the animals do not have to enter a box or corral nor feed next to a strange object such as a rocket net.

Examples in Illinois include: Busse Woods Nature Preserve and Forest Preserve, Cook--County Forest Preserve District, near Elk Grove Village where high deer numbers were reduced to, and then maintained at, <7 deer per square kilometer for the past 7 years in order for native vegetation recovery and regeneration; Chicago-O'Hare International Airport, Ryerson Conservation Area/Nature Preserve, Lake County Forest Preserve District near Lincolnshire; Chicago Botanic Gardens in Glencoe; Morton Arboretum in Lisle; and Rock Cut State Park in Rockford. In the latter case, sharpshooting followed a 39-day archery hunt.

3) Live capture and euthanization: In this case, deer are humanely euthanized per the 1986 Report of the American Veterinary Medical Association on Euthanasia (currently being revised); in Illinois, methods of euthanasia are further restricted to those that would allow the carcasses to be processed and donated to charities for human consumption.

PRO's: In areas with large numbers of deer, especially those areas where deer have degraded/depleted their native foods, numerous deer can be removed in a relatively short period of time (e.g., during February-May 1989, 18 of 27 (67%) deer-box-trapped at Ryerson Conservation Area in Lake County were captured during the first 15 days of trapping). Additionally, this technique allows great specificity in the sex and age of animals collected.

CON's: Constraints described earlier for live capture and translocation apply to this technique; animals must be baited to a site, captured via nets or traps, and handled one at a time. Therefore, as deer numbers decrease and the animals become wary, trapping success drops off rapidly. Using this technique alone, managers may not be able to capture enough animals at lower herd densities to attain reduction program objectives. Cost is also an important consideration. Although deer are not translocated, personnel are required to bait daily, remove deer from traps, field-dress carcasses, and transport them to a meat processing facility. Carcass processing costs in NE Illinois range from \$45-\$60 per deer.

4) Biological control by introducing predator or pathogen: Herd control would be attempted by introducing a natural and effective predator of deer (e.g., wolves or mountain lions) or a disease or parasite into areas of high deer densities.

PRO's: Reintroduction of an endemic predator species to parts of its former range. Costs and human intervention would be minimal after initial introduction of predator or pathogen.

CON's: In manmade and human-dominated environments (urban/suburban and intensive agricultural areas alike), lack of suitable habitat and lack of exclusive selectivity for the target species (deer) by the predator eliminates this technique from consideration. Predators may find unprotected livestock and/or family pets to be more easily caught and killed than the species that they were imported to control. Additionally, large carnivores have very large home ranges that would not be accommodated in most areas, other than large national parks or wilderness areas; this leads to predators dispersing into other areas and/or being killed on roadways. Introduction of a disease or parasite is similarly not a realistic option; lack of species specificity (other nontarget species such as domestic livestock may be affected) and absence of any control on the number and types of animals that are infected definitely rule out this method.

5) Poisoning: Although not considered to be a realistic or viable option due to concerns for human safety, potential impacts upon nontarget species, and lack of control over the number of animals affected, this technique is listed here as an example of the other extreme (opposite of "let Nature take its course") of the spectrum of methods for controlling deer numbers.

D) Lethal Damage Abatement

Although lethal damage abatement techniques are essentially the same methods as 1 & 2 above, the focus, in this case, is on the removal of specific problem animals that have habituated to using specific area, crop, or plant on individual private properties. In 1991, the Illinois Department of Conservation liberalized the annual harvest of white-tailed deer (on a county-by-county basis) statewide

to address concerns expressed by several landowner associations. Specifically, landowners with ≥ 40 acres could obtain more deer hunting permits free-of-charge, hunters could legally harvest more deer than in the past, types and lengths of hunting seasons were modified, and permits issued and county harvest quotas reflected the need to harvest a greater proportion of females/does in order to slow, or stop, herd growth in some areas of the State. Additionally, the nuisance Deer Removal Permit (DRP) system was liberalized such that landowners could remove numerous "nuisance" deer from their property in attempts to reduce deer browsing or antler-rubbing damage; a site-evaluation to confirm/document the extent and distribution of reported deer damage, conducted by department personnel, is prerequisite to issuance of a DRP.

1) Hunting:

PRO's: Constitutes a relatively quick and efficient means of removing a desired number and sex(es) of deer specified by the landowner with minimal cost to the latter. Contacting the local hunt clubs, sportsmen clubs, or shooting ranges would generally put the landowner in touch with several hunters willing to hunt his/her property. Landowners often fear the responsibility for any accidental injuries that hunters might sustain while on his/her property; however, the Recreational Use of Land and Water Areas Act (Illinois Revised Statutes, Chapter 70), revised in 1987, limits landowner liability for accidents/injuries to hunters allowed access to the property, even if hunters make contributions to the landowner "for the purposes of properly conserving the land".

CON's: If adjacent properties are not hunted and provide refuge for deer, hunting may not remove enough animals to provide relief from deer damage. In this case, the landowner should promote hunting not only on his/her property but also by neighbors. The legal hunting season is during the fall-winter only; hunting would not be an option for removing "nuisance" deer causing damage at other times of the year. Hunting may not be possible in some areas due to proximity of residences or roadways or due to property being within incorporated boundaries of a municipality with ordinances against the discharge of firearms.

2) Removal of "nuisance" deer under authority of a Deer Removal Permit outside the regular firearm deer hunting season:

PRO's: Allows the landowner (or other specified shooter) to remove animals actually causing damage. To this end, DRP's are generally issued for antlerless deer but this restriction can be waived if damage is due to antler-rubbing. If used as part of a multiple abatement technique approach (e.g., hunting allowed plus electric fence around critical crops/areas and/or repellents on important plants plus removals under a DRP as a last resort), selective shooting can complete the reduction, if not elimination, of deer-related damage.

CON's: Selective shooting requires considerable effort by the landowner (or specified shooter); the latter must be prepared to collect deer when they are present and to process carcasses. Selective removals from one landowner's property alone will not address the issue of damage abatement if the problem is one of a regional overabundance of deer. If deer numbers on adjacent properties are not controlled via hunting or other means (i.e., adjacent properties serve as refuges for deer), then the landowner may be faced with trying to remove

nuisance deer throughout the year (dependent upon the crop and type of damage) and every year. Issuance of DRP's for properties within incorporated municipal boundaries may not be possible. If ordinances preclude the discharge of a firearm, the landowner must rely on repellents, deterrents, and/or fences to prevent damage, and/or selective removal of "nuisance" deer by the municipality (or representatives thereof) under authority of DPCPs issued to the village, town, or city.

Literature Cited:

- Andelt, W.F., K.P. Burnham, and J.A. Manning. 1991. Relative effectiveness of repellents for reducing mule deer damage. *J. Wildl. Manage.* 55:341-347.
- Bashore, T.L., and E.D. Bellis. 1982. Deer on Pennsylvania airfields: problems and means of control. *Wildl. Soc. Bull.* 10:386-388.
- Bell, R.L., and T.J. Peterle. 1975. Hormone implants control reproduction in white-tailed deer. *Wildl. Soc. Bull.* 3:152-156.
- Botti, F.L. 1985. Chemosterilants as a management option for deer on Angel Island: lessons learned. *Cal-Neva Wildl. Trans.* 61-65.
- Brush, C.C., and D.W. Ehrenfeld. 1990. Control of white-tailed deer in non-hunted reserves and urban fringe areas. *Proc. Nat. Inst. Urban Wildl. Sump.* (in press).
- Byrme, A.E. 1989. Experimental applications of high-tensile wire and other fencing to control big game damage in northwest Colorado. Ninth Great Plains Wildl. Dam. Cont. Workshop, Ft. Collins, CO.
- Conover, M.R. 1987. Comparison of two repellents for reducing deer damage to Japanese yews during winter. *Wildl. Soc. Bull.* 15:265-268.
- _____. 1988. Browsing preference of white-tailed deer for different ornamental species. *Wildl. Soc. Bull.* 16:175-179.
- Cox, M.L. No date. Co-existing with deer. *Pacific Hort.* 21-27.
- Cummings, M.W., M.H. Kimball, and W.M. Longhurst. 1963. Deer-resistant plants for ornamental use. California Agriculture Experimental Station Extension Service, Univ. of California. 5pp.
- Ellingwood, M.R., and J.B. McAninch. 1984. Update of the Institute of Ecosystem Studies deer damage control project. *Trans. NE Deer Tech. Comm.* 20:6-7.
- _____, J.B. McAninch, and M.J. Fargione. 1985. Current status of deer fencing in the northeast. Pages 180-185 in P.T. Bromley, ed. *Proceedings of the Second Eastern Wildlife Damage Control Conference*, North Carolina State Univ., Raleigh, NC. 281pp.
- Falk, N.W., H.B. Graves, and E.D. Bellis. 1978. Highway right-of-way fences as deer deterrents. *J. Wildl. Manage.* 42:646-650.
- Feeney, W.S. 1946. Some deer food preferences: Schlitz Audubon Center. Wisconsin Wildl. Research Progr. Rep., Vol. V. 3pp.
- Harris, M.T., W.L. Palmer, and J.L. George. 1983. Evaluation of white-tailed deer repellents. *J. Wildl. Manage.* 47:516-519.

- Heintzelman, D.S. 1988. The 1987-1988 Tyler State Park deer hunts: an examination and critique. Wildl. Info. Ctr. Cons. Rep. #3. Allentown, PA. 25pp.
- Hygndstrom, S.E., and S.R. Craven. 1988. Electric fences and commercial repellents for reducing deer damage in cornfields. Wildl. Soc. Bull. 16:291-296.
- Ingebrigtsen, D.K., and J.R. Ludwig. 1986. Effectiveness of Swareflex wildlife warning reflectors in reducing deer-vehicle collisions in Minnesota. Minn. Dept. Nat. Reso. Wildl. Rep. 3. 5pp.
- Jones, J.M., and J.H. Witham. 1990. Post-translocation survival and movements of metropolitan white-tailed deer. Wildl. Soc. Bull. 18:434-441.
- Kirkpatrick, J.F., I.K.M. Liu, and J.W. Turner, Jr. 1990. Remotely-delivered immunocontraception in feral horses. Wildl. Soc. Bull. 18:326-330.
- Ludwig, J., and T. Bremicker. 1981. Evaluation of 2.4-meter fences and one-way gates for reducing deer-vehicle collisions. Minnesota Wildl. Res. Quart. 41:77-88.
- Matschke, G.H. 1976. Non-efficacy of mechanical birth control devices for white-tailed deer. J. Wildl. Manage. 40:792-795.
- _____. 1977. Fertility control in white-tailed deer by steriod implants. J. Wildl. Manage. 44:756-758.
- _____. 1980. Efficacy of steriod implants in preventing pregnancy in white-tailed deer. J. Wildl. Manage. 44:756-758.
- Matthews, W.C., Jr., and L.L. Glasgow. 1981. Deer preference ratings of Louisiana woody plant species. LSU Forestry Note #133, School of Forestry and Wildlife Management, Baton Rouge, LA. 5pp.
- McCullough, D.R. 1988. Demography and movement of wild populations by reproductive intervention. In U.S. Seal, ed. Contraception in wildlife (in press).
- Myers, R.K., and B.K. Miller. 1990. Inexpensive electric fences for preventing browse damage by white-tailed deer. Coop Ext. Serv. Rep., Purdue Univ., West Lafayette, IN.
- Nixon, C.M., L.P. Hansen, P.A. Brewer, and J.E. Chelsvig. 1991. Longevity of female white-tailed deer on a refuge in Illinois. Trans. Ill. Acad. Sci. 84:84-91.
- Palmer, W.L., R.G. Wingard, and J.L. George. 1983. Evaluation of white-tailed deer repellents. Wildl. Soc. Bull. 11:164-166.
- _____, J.M. Payne, R.G. Wingard, and J.L. George. 1985. A practical fence to reduce deer damage. Wildl. Soc. Bull. 13:240-245.

- Pietsch, L.R. 1954. White-tailed deer populations in Illinois. Biol. Note 34, Ill. Natural History Survey, Urbana. 22pp.
- Porter, W.F. 1983. A baited fence for controlling deer damage to orchard seedlings. Wildl. Soc. Bull. 4:325-327.
- Roughton, R.D. 1979. Effects of oral MGA on reproduction in captive white-tailed deer. J. Wildl. Manage. 43:428-436.
- Schafer, J.A., and S.T. Penland. 1985. Effectiveness of Swareflex reflectors in reducing deer-vehicle accidents. J. Wildl. Manage. 49:774-776.
- Schellhaass, D. No date. McHenry County Conservation District report on the effectiveness of reflective mirrors in reducing deer-motor vehicle collisions. McHenry Co. Conserv. Dist., Ringworm, IL. 9pp.
- Schmitz, O.J. 1990. Management implications of foraging theory: evaluating deer supplemental feeding. J. Wildl. Manage. 54:522-532.
- Selders, A.W., and J.B. McAninch. 1987. High-tensile wire fencing. NE Reg. Agric. Eng. Serv. 26pp.
- Swihart, R.K., and M.R. Conover. 1990. Reducing deer damage to yews and apple trees: testing Big Game Repellent, Ro-pel, and soap as repellents. Wildl. Soc. Bull. 18:156-162.
- Tierson, W.C. 1969. Controlling deer use of forest vegetation with electric fences. J. Wildl. Manage. 33:922-926.
- Verme, L.J., and D.U. Ullrey. 1984. Physiology and nutrition. Pages 91-118 in L.K. Halls, ed. White-tailed deer ecology and management. Stackpole Books, Harrisburg, PA. 870pp.
- Wegner, R. 1984. Deer fences and other contrivances. Deer and deer hunting magazine (June):15-29.
- Wemmer, C., and M. Stuwe. 1985. Reducing deer populations in large enclosures with drives. Wildl. Soc. Bull. 13:245-248.
- West Virginia Cooperative Extension Service. 1985. Deer and agriculture in West Virginia: repellents for deer control. WV Univ. Coop. Ext. Serv. Pub. No. 808. 3pp.
- Wobeser, G., and W. Runge. 1975. Rumen overload and rumenitis in white-tailed deer. J. Wildl. Manage. 39:596-600.
- Wood, P., and M.L. Wolfe. 1988. Intercept feeding as a means of reducing deer-vehicle collisions. Wildl. Soc. Bull. 16:376-380.

Other pertinent articles:

- Angradi, T. R., and W. M. Tzilkowski. 1986. Uptake and phytotoxicity of selenium in black cherry and white ash seedlings. *Forest Sci.* 32:806-811.
- _____. 1987. Preliminary testing of a selenium-based systemic deer browse repellent. *Proc. Eastern Wildl. Dam. Cont. Conf.* 3:102-107.
- Craven, S. R., and S. Hygnstrom. 1983. Controlling deer damage in Wisconsin. Dept. Agric. Journalism, Univ. of Wisconsin, Coop. Ext. Rep. No. G3083. 12pp.
- Ellingwood, M.R., and S.L. Caturano. 1988. An evaluation of deer management options. New England Chapter of The Wildlife Society and Northeast Deer Technical Committee, Pub. No. DR-11. 12pp.
- Goldsmith, A.E. 1982. The Angel Island deer herd: a case history of wildlife management controversy. *Cal-Neva Wildl. Trans.*:78-82.
- Ishmael, W.E., and O.J. Rongstad. 1984. Economics of an urban deer removal program. *Wildl. Soc. Bull.* 12:394-398.
- McAninch, J.B., M.R. Ellingwood, and R.J. Winchcombe. 1983. Deer damage control in New York agriculture. NY Dept. of Agric. and Markets, State Campus, Albany, NY. 11pp.
- Palmer, D.T., D.A. Andrews, R.O. Winters, and J.N. Francis. 1980. Removal techniques to control an enclosed deer herd. *Wildl. Soc. Bull.* 8:29-33.
- Pennsylvania Game Commission. 1982. Pennsylvania wildlife nuisance and damage control, number 12: deer. Penn. Game Comm., Penn. State Univ., and U.S. Fish and Wildl. Serv. 4pp.
- Pojar, T.M., R.A. Prosen, D.F. Reed, and T.N. Woodard. 1975. Effectiveness of a lighted, animated deer crossing sign. *J. Wildl. Manage.* 39:87-91.
- Puglisi, M.J., J.S. Lindzey, and E.D. Bell. 1974. Factors associated with highway mortality of white-tailed deer. *J. Wildl. Manage.* 38:799-807.
- Reed, D.F., T.N. Woodard, and T.M. Pojar. 1975. Behavioral responses of mule deer to a highway underpass. *J. Wildl. Manage.* 39:361-367.
- _____. 1981. Effectiveness of highway lighting in reducing deer-vehicle accidents. *J. Wildl. Manage.* 45:721-726.
- _____, T.D.I. Beck, and T.N. Woodard. 1982. Methods of reducing deer-vehicle accidents: benefit-cost analysis. *Wildl. Soc. Bull.* 10:349-354.
- Scott, J.D., and T.W. Townsend. 1985. Methods used by selected Ohio growers to control damage by deer. *Wildl. Soc. Bull.* 13:234-240.

Appendix E: Ornamental plants documented as being damaged by white-tailed deer in NE Illinois.

1) PLANTS BROWSED BY DEER:

a) Trees (while in deer's reach):

Acer circinatum (Vine Maple), A. grandidentatum (Big-toothed Maple),
A. macrophyllum (Bigleaf Maple), A. opalus (var. obtusatum) (Italian Maple),
A. platanoides (Norway Maple), A. rubrum (Red Maple), A. saccharinum (Silver Maple), A. saccharum (Sugar Maple), and A. tataricum (Tartarian Maple)
Aesculus sp. (Buckeye)
Alnus spp. (Alders) including A. incana ('Pendula'- Speckled Alder),
A. glutinosa, A. japonica (Japanese Alder), and A. viridis (Green Alder)
Betula sp. (Birch)
Broussonetia papyrifera (Paper Mulberry)
Carpinus betulus (European Hornbeam) and C. cordata (Heartleaf Hornbeam)
Carya cordiformis (Bitternut Hickory)
Cercocarpus ledifolius (Curly-leaved Mountain Mahogany) and C. montanus (Colorado Mountain Mahogany)
Cornus drummondii (Rough-leaved Dogwood)
Crataegus spp. (Hawthorns) including C. coccinea (Scarlet Hawthorn),
C. pruinosa var. brachypoda (Frosted Hawthorn), and C. viridis (Green Hawthorn)
Fagus spp. (Beeches)
Fraxinus pennsylvanica (Red Ash)
Laburnum anagyroides var. alschingeri (Golden Chain Tree)
Malus spp. (apples and crabapples) including Malus baccata (var. mandshurica)(Siberian Crab), M. coronaria (var. dasycalyx)(Wild Sweet Crab) and M. ioensis (Iowa Crab)
Nyssa sylvatica (Black or Sour Gum)
Pinus mugo (Swiss Mountain Pine)
Populus spp. (Poplars, Cottonwoods, Aspens, etc.)
Prunus spp. (Cherries, Plums, Peach, etc.) including P. americana (Wild Plum), P. x cistena (Purpleleaf Sand Cherry), and P. tenella (Dwarf Russian Almond)
Pyrus spp. (Pears) including P. ussuriensis (Ussurian Pear)
Quercus spp. (Oaks) including Q. alba (White Oak), Q. arkansana (Arkansas Oak), Q. bicolor (Swamp White Oak), Q. gambelii (Gambel's Oak), Q. macrocarpa (Burr Oak), Q. muhlenbergii (Chinquapin Oak), and Q. rubra (Red Oak)
Rhamnus spp. (Buckthorns) including R. caroliniana (Carolina Buckthorn), R. crenata, R. purshiana (Cascara Sagrada), and R. smithii
Robinia pseudoacacia (Black Locust)
Salix arizonica (Arizona Willow), S. daphnoides (Violet Willow), S. discolor (Pussy Willow), S. pentandra (Bay-leaved Willow), S. purpurea (Purple Willow), and Salix x wimmeriana
Sorbus torminalis
Tilia spp. (Basswoods or Lindens) including T. amurensis (Amur Linden)

b) Shrubs, vines, and other woodies:

Amelanchier sp. (Serviceberry)
Arctostaphylos uva-ursi var. coactilis (Bearberry)
Aronia melanocarpa (Black Chokeberry)
Berberis thunbergii (Japanese Barberry)
Celastrus scandens (Bittersweet)
Chaenomeles sinensis (Chinese Flowering Quince)
Chamaebatiaria millefolium (Desert Sweet)
Clethra alnifolia (Sweet Pepperbush)
Colutea arborescens (Bladder Senna)
Corvulus spp. (Hazelnut) including C. americana (American Hazelnut) and
C. avellana (European Hazelnut)
Cotoneaster divaricata (Spreading Cotoneaster)
Cydonia oblonga (Quince)
Elaeagnus umbellata (Chinese Oleaster or Autumn Olive)
Euonymus alatus (Winged Euonymus, Burningbush), E. bungeanus (Manchurian
Spindle Tree, E. europaeus (var. intermedius) (European Spindle Tree),
E. maackii (Korean Spindle Tree), E. nanus, E. nikoensis, and E. phellomanus
(Corky Spindle Tree)
Forsythia spp. (Forsythias) including F. suspensa (Golden Bell)
Fothergilla major (Fothergilla or Witch Alder)
Genista pilosa and G. tinctoria var. hirsuta (Dyer's Greenweed)
Hamamelis vernalis f. carnea (Witch Hazel)
Hedera helix (English Ivy)
Ilex spp. (Hollies) including I. decidua (Possum Haw), I. glabra (Inkberry),
and I. verticillata (Winterberry)
Jamesia americana (Cliff Bush)
Jasminum fruticans (Jasmine)
Kalmia latifolia (Sheep or Mountain Laurel)
Ligustrum obtusifolium (Border Privet)
Lonicera spp. (Honeysuckles) including L. xylosteum (European Fly Honeysuckle)
Morus australis or bombycis (Mulberry)
Pachistima myrsinites (Oregon Boxwood)
Parthenocissus quinquefolia (Virginia Creeper)
Peraphyllum ramosissimum (Squaw Apple)
Philadelphus lewisii (Mockorange) and P. tenuifolius
Physocarpus intermedius (Ninebark)
Rhamnella franguloides
Rhododendron spp. including 'Nadine', R. atlanticum (Dwarf Azalea),
R. canescens, R. flavum (Pontic Azalea), R. japonicum (Japanese Azalea),
R. micranthum (Manchurian Azalea), and R. yedoense (Yodogawa Azalea)
Rhus spp. (Sumacs) including R. lanceolata (Lance-leaved Sumac), R. radicans
(Poison Ivy), R. trilobata (Fragrant Sumac), and R. typhina (Staghorn
Sumac)
Ribes alpinum (Alpine Currant)
Rosa spp. (Roses) including R. gymnocarpa (Wood Rose), R. pendulina (Alpine
Rose), and R. pimpinellifolia (Scotch Rose)
Sambucus nigra (European Elderberry)
Spiraea x bumalda

b) Shrubs, vines, and other woodies (cont.):

Syringa spp. (Lilacs) including S. patula (Manchurian Lilac) and S. reticulata (Japanese Tree Lilac)

Taxus spp. (Yews) including T. baccata ('Adpressay' English Yew),
T. chinensis (Chinese Yew), T. cuspidata ('Densa' and Wilsonii) (Japanese Yews), T. x media ('Farmen', 'Tauntonii', and 'Vermeulen')

Thuja spp. (Arborvitae)

Tsuga spp. (Hemlocks)

Viburnum opulus (European Highbush Cranberry), V. x rhytidophylloides ('Alleghany' and 'Willowwood'), V. rhytidophyllum (Leather-leaved Viburnum), and V. trilobum (American Highbush Cranberry)

c) Herbaceous plants:

Anthemis tinctoria (Yellow Chamomile)

Aquilegia canadensis (Wild Columbine)

Arisaema triphyllum (Jack-in-the-pulpit)

Aster spp. (Asters)

Boltonia asteroides (False Aster)

Campanula carpatica (Blue Chips, Bellflower)

Centaurea montana (Knapweed)

Chrysanthemum sp. (Mums)

Clematis recta

Crocus sp. (Crocuses)

Daucus carota (Wild Carrot, Queen Anne's Lace)

Dodecatheon meadia (Shooting Star)

Echinacea spp. (Purple Coneflowers)

Erythronium spp. (Trout Lilies)

Ferns - various genera

Foeniculum vulgare (Sweet Fennel)

Geranium spp. (Geraniums, Cranesbill)

Gomphrena globosa (Globe Amaranth)

Grasses (e.g., Miscanthus sacchariflorus or Silver Grass) and some sedges

Helianthemum grandiflorum (Rock-Rose)

Hemerocallis spp. (Daylilies)

Heuchera richardsonii (Prairie Alum Root)

Hibiscus spp.-Tosca & Lohengrin hybrids

Hydrophyllum virginianum (Virginia Waterleaf)

Impatiens capensis (Spotted Touch-me-not, Orange Jewelweed)

Impatiens sultanii (Impatiens)

Iris cristata (Crested Iris)

Kirengeshoma palmata

Lilium spp. (Lilies)

Myosotis alpestris (Forget-me-nots)

Papaver spp. (Poppies)

Phlox divaricata (Woodland Phlox)

Rudbeckia fulgida (Black-eyed Susan)

Scilla sibirica (Siberian Squill)

Sedum spp. (Sedums)

Tradescantia ohiensis (Spiderwort)

Tricyrtis spp. (Japanese Toadlilies)

Trillium grandiflorum (Large-flowered Trillium)

Tulips - any kind!

Viola spp. (Violets, Pansies)

c) Vegetable garden plants:

Broccoli - all varieties/cultivars

Cabbage - " "

Lettuce

Ornamental kale

2) Plants damaged by antler-rubbing:

Alnus incana (Speckled Alder)

Aralia chinensis (Chinese Angelica Tree)

Caragana arborescens (Siberian Pea Shrub)

Chosenia bracteosa

Cornus alternifolia (Alternate-leaved Dogwood) and C. x slavini

Euonymus atropurpureus (Burningbush, Wahoo)

Malus hupehensis (Tea Crab)

Prunus maackii (Amur Chokecherry)

Rhus typhina (Staghorn Sumac)

Salix daphnoides (Violet Willow), S. cinerea (Gray Willow), S. elaeagnos (Gray Willow), S. humilis (Prairie Willow), S. lucida (Shining Willow), and S. purpurea (Purple Willow)

Tilia cordata

Viburnum acerifolium (Maple-leaved Viburnum)

*numerous local nursery growers have reported antler-rubbing damage to locust and linden saplings and, to a lesser extent, oak, maple, and hawthorn saplings.

The information herein was provided (and edited) by Mr. Kris Bachtell (Collections Group Administrator, Morton Arboretum), Ms. Diane Brown (Plant Protection Supervisor, Chicago Botanic Gardens), and Mr. Richard Morris (formerly with the Chicago Botanic Gardens who provided a list for 1984). Compiled by J.M. Jones (IDOC), November 1991.

HOME-GROUNDS-GARDEN

CORNELL COOPERATIVE EXTENSION

Resistance of Woody Ornamental Plants to Deer Damage

M.J. Fargione, P.D. Curtis, and
M.E. Richmond

Wildlife Damage Management Program,
Department of Natural Resources,
Cornell University

Damage to ornamental plants by white-tailed deer (*Odocoileus virginianus*) has increased during the past decade. This has been associated with: (1) increasing deer abundance; (2) human population shifts to rural and suburban homesites; (3) the maturing of abandoned agricultural lands into deer habitat; (4) landowner decisions to prevent deer hunting; and (5) restrictions on firearms use in suburban regions.

In the short run, this situation is largely irreversible. Damage problems, particularly in suburban areas having good quality deer habitat, are likely to intensify in the future. Clearly, elimination of hunting, due to firearms restrictions, safety concerns, and changed landowner values, will only increase damage in these areas.

Deer Feeding Habits

Deer are selective feeders; they forage on plants or plant parts with considerable discrimination. Their obvious preference for and apparent avoidance of certain plants can be turned to our advantage. Costly browsing damage may be reduced or eliminated by planting less-preferred species or by establishing susceptible plants only in areas protected from deer. Under most circumstances, landscaping based on a knowledge of deer feeding preferences can provide an alternative to the use of expensive chemical repellents and unsightly physical barriers.

Whether or not a particular plant species or variety will be eaten depends on the deer's previous experience, nutritional needs, plant palatability, seasonal factors, weather conditions, and the availability of alternative foods. Deer are creatures of habit, and prior movement patterns or foraging experience can foretell where damage will occur. Deer also are known to feed selectively on fertilized plantings and managed croplands. New plantings added to an existing landscape already severely damaged by deer will likely suffer extreme browsing pressure.

In general, the most damage takes place when winter snow cover has reduced food availability. Rather than face starvation, deer will browse even the most resistant plants during periods of food shortage. Under such conditions, other damage control measures should be combined with careful plant selection. Ultimately, a reduction in deer herd size is the most effective solution to the damage problem. Information on repellents, physical barriers (i.e., fencing), and deer population control are

available from Cornell Cooperative Extension agents, New York State Department of Environmental Conservation (DEC) regional biologists, and from the following Cornell publications: *Past Management Recommendations for Control of Vertebrates and Control of Wildlife Damage in Homes and Gardens*.

Plant-damage Comparisons

The following tables provide a guide to the relative likelihood of deer damage to many ornamental woody plants used by New York landscape contractors and property owners. This information can be useful both for selecting plants that are unlikely to be damaged by deer, as well as for identifying those ornamentals that frequently require protection. The four categories identified below are based on the combined experiences and numerical rankings of nursery operators, landscape contractors, Cornell Cooperative Extension personnel, research staff, and other professional horticulturists from the northeastern states. The information was derived from personal communications, published articles, and unpublished reports. The user is cautioned that the deer-browsing resistance of any plant species may change due to fluctuations in deer populations, alternative food availability, and environmental factors mentioned previously. No plant species will be avoided by deer under all conditions.

Plants listed in the "Rarely Damaged" category are infrequently fed upon by deer, and are the best candidates for landscapes prone to deer damage. Deer sometimes feed on ornamentals listed as "Seldom Severely Damaged," but damage is usually minor and has limited effect on the shape or attractiveness of the plant. The category "Occasionally Severely Damaged" includes plants which may be severely damaged by deer. Finally, ornamental plants in the category "Frequently Severely Damaged" appear to be preferred by deer, and usually require physical or chemical protection whenever deer are present. Check before planting any of the species listed below to ensure that they are adapted for your local climatic and soil conditions.



Wildlife Damage
Management Program

Plants Rarely Damaged:

<u>Botanical name</u>	<u>Common name</u>
<i>Berberis</i> spp.	Barberry
<i>Berberis vulgaris</i>	Common Barberry
<i>Betula papyrifera</i>	Paper Birch
<i>Buxus sempervirens</i>	Common Boxwood
<i>Elaeagnus angustifolia</i>	Russian Olive
<i>Ilex opaca</i>	American Holly
<i>Leucothoe fontanesiana</i>	Drooping Leucothoe
<i>Picea pungens</i>	Colorado Blue Spruce
<i>Pieris japonica</i>	Japanese Pieris

Plants Seldom Severely Damaged:

<u>Botanical name</u>	<u>Common name</u>
<i>Betula pendula</i>	European White Birch
<i>Calasturus scandens</i>	American Bittersweet
<i>Cornus sericea</i>	Red Osier Dogwood
<i>Cornus florida</i>	Flowering Dogwood
<i>Cornus kousa</i>	Kousa Dogwood
<i>Crataegus laevigata</i>	English Hawthorn
<i>Enkianthus campanulatus</i>	Redvein Enkianthus
<i>Fagus sylvatica</i>	European Beech
<i>Forsythia</i> spp.	Forsythia
<i>Gleditsia triacanthos</i>	Honey Locust
<i>Ilex cornuta</i>	Chinese Holly
<i>Ilex glabra</i>	Inkberry
<i>Juniperus chinensis</i>	Chinese Junipers (green)
<i>Juniperus chinensis</i>	Chinese Junipers (blue)
<i>Kalmia latifolia</i>	Mountain Laurel
<i>Kolkwitzia amabilis</i>	Beautybush
<i>Picea abies</i>	Norway Spruce
<i>Picea glauca</i>	White Spruce
<i>Pinus nigra</i>	Austrian Pine
<i>Pinus rigida</i>	Pitch Pine
<i>Pinus mugo</i>	Mugo Pine
<i>Pinus resinosa</i>	Red Pine
<i>Pinus sylvestris</i>	Scots Pine
<i>Prunus serotina</i>	Japanese Flowering Cherry
<i>Salix matsudana tortuosa</i>	Corkscrew Willow
<i>Sassafras albidum</i>	Common Sassafras
<i>Syringa vulgaris</i>	Common Lilac
<i>Wisteria floribunda</i>	Japanese Wisteria

Plants Occasionally Severely Damaged:

<u>Botanical name</u>	<u>Common name</u>
<i>Abies concolor</i>	White Fir
<i>Acer griseum</i>	Paperbark Maple
<i>Acer rubrum</i>	Red Maple
<i>Acer saccharinum</i>	Silver Maple
<i>Acer saccharum</i>	Sugar Maple
<i>Aesculus hippocastanum</i>	Common Horsechestnut
<i>Amelanchier arborea</i>	Downy Serviceberry
<i>Amelanchier laevis</i>	Allegheny Serviceberry
<i>Campsis radicans</i>	Trumpet Creeper
<i>Chaenomeles speciosa</i>	Japanese Flowering Quince
<i>Cornus racemosa</i>	Panicled Dogwood
<i>Cotinus coggygria</i>	Smokebush
<i>Cotoneaster</i> spp.	Cotoneaster
<i>Cotoneaster apiculatus</i>	Cranberry Cotoneaster
<i>Cotoneaster horizontalis</i>	Rockspray Cotoneaster
<i>Cryptomeria japonica</i>	Japanese Cedar
<i>Forsythia (x) intermedia</i>	Border Forsythia
<i>Hamamelis virginiana</i>	Common Witchhazel
<i>Hibiscus syriacus</i>	Rose of Sharon
<i>Hydrangea arborescens</i>	Smooth Hydrangea
<i>Hydrangea anomala petiolaris</i>	Climbing Hydrangea
<i>Hydrangea paniculata</i>	Panicle Hydrangea

<i>Ilex crenata</i>	Japanese Holly
<i>Ilex (x) meserveae</i>	China Girl/Boy Holly
<i>Juniperus virginiana</i>	Eastern Red Cedar
<i>Larix decidua</i>	European Larch
<i>Lonicera (x) heckrottii</i>	Goldflame Honeysuckle
<i>Ligustrum</i> spp.	Privet
<i>Magnolia (x) soulangiana</i>	Saucer Magnolia
<i>Metasequoia glyptostroboides</i>	Dawn Redwood
<i>Parthenocissus quinquefolia</i>	Virginia Creeper
<i>Philadelphus coronarius</i>	Sweet Mock Orange
<i>Pinus strobus</i>	Eastern White Pine
<i>Potentilla fruticosa</i>	Bush Cinquefoil
<i>Prunus avium</i>	Sweet Cherry
<i>Pseudotsuga menziesii</i>	Douglas Fir
<i>Pyracantha coccinea</i>	Firethorn
<i>Pyrus calleryana 'Bradford'</i>	Bradford Callery Pear
<i>Pyrus communis</i>	Common Pear
<i>Quercus alba</i>	White Oak
<i>Quercus prinus</i>	Chestnut Oak
<i>Quercus rubra</i>	Northern Red Oak
<i>Rhododendron</i> spp.	Deciduous Azaleas
<i>Rhododendron carolinianum</i>	Carolina Rhododendron
<i>Rhododendron maximum</i>	Rosebay Rhododendron
<i>Rhus typhina</i>	Staghorn Sumac
<i>Rosa multiflora</i>	Multiflora Rose
<i>Rosa rugosa</i>	Rugosa Rose
<i>Salix</i> spp.	Willows
<i>Spiraea (x) bumalda</i>	Anthony Waterer Spiraea
<i>Spiraea prunifolia</i>	Bridalwreath Spiraea
<i>Syringa (x) persica</i>	Persian Lilac
<i>Syringa reticulata</i>	Japanese Tree Lilac
<i>Syringa villosa</i>	Late Lilac
<i>Tilia cordata 'Greenspire'</i>	Greenspire Littleleaf Linden
<i>Tilia americana</i>	Basswood
<i>Tsuga canadensis</i>	Eastern Hemlock
<i>Tsuga caroliniana</i>	Carolina Hemlock
<i>Viburnum (x) juddii</i>	Judd Viburnum
<i>Viburnum rhytidophyllum</i>	Leatherleaf Viburnum
<i>Viburnum plicatum tomentosum</i>	Doublefile Viburnum
<i>Viburnum carlesii</i>	Koreanspice Viburnum
<i>Weigela florida</i>	Oldfashion Weigela

Plants Frequently Severely Damaged:

<u>Botanical name</u>	<u>Common name</u>
<i>Abies balsamea</i>	Balsam Fir
<i>Abies fraseri</i>	Fraser Fir
<i>Acer platanoides</i>	Norway Maple
<i>Cercis canadensis</i>	Eastern Redbud
<i>Chamaecyparis thyoides</i>	Atlantic White Cedar
<i>Clematis</i> spp.	Clematis
<i>Cornus mas</i>	Cornelian Dogwood
<i>Euonymus alatus</i>	Winged Euonymus
<i>Euonymus fortunei</i>	Wintercreeper
<i>Hedera helix</i>	English Ivy
<i>Malus</i> spp.	Apples
<i>Prunus</i> spp.	Cherries
<i>Prunus</i> spp.	Plums
<i>Rhododendron</i> spp.	Rhododendrons
<i>Rhododendron</i> spp.	Evergreen Azaleas
<i>Rhododendron catawbiense</i>	Catawba Rhododendron
<i>Rhododendron periclymenoides</i>	Pinxterbloom Azalea
<i>Rosa (x) hybrid</i>	Hybrid Tea Rose
<i>Sorbus aucuparia</i>	European Mountain Ash
<i>Taxus</i> spp.	Yews
<i>Taxus baccata</i>	English Yew
<i>Taxus brevifolia</i>	Western Yew
<i>Taxus cuspidata</i>	Japanese Yew
<i>Taxus (x) media</i>	English/Japanese Hybrid Yew
<i>Thuja occidentalis</i>	American Arborvitae

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References

- Caslick, J.W. and D.J. Decker. 1981. Control of Wildlife Damage in Homes and Gardens. CCE publ. 147IB176, Dept. Nat. Resour., N.Y.S. Coll. Agric. and Life Sci., Cornell Univ., Ithaca. 28 pp.
- Conover, M.R. and G.S. Kania. 1988. Browsing preferences of white-tailed deer for different ornamental shrubs. *Wildl. Soc. Bull.* 16:175-179.
- Cummings, M.W., M.H. Kimball, and W.M. Longhurst. 1980. Deer-resistant Plants for Ornamental Use. Leaflet 2167, Div. Agric. Sci., Univ. Cal., Oakland. 7 pp.
- Curtis, P.C., M.J. Fargione, S.C. Frantz, C.V. Trimarchi, and M.E. Tobin. 1990. Pest Management Recommendations for Control of Vertebrates. CCE Publ., Resource Center, Cornell Univ., Ithaca, NY. 16 pp.
- McAninch, J.B. and M.J. Fargione. 1987. Characteristics of Deer Damage in Selected Plant Industries of New York State. Unpubl. Rep. Proj. No 4943. Submitted to N.Y.S. Dept. Agric. and Markets. Albany. 106 pp.
- Sayre, R.W. and D.J. Decker. 1990. Deer Damage to the Ornamental Horticulture Industry in Suburban New York: Extent, Nature and Economic Impact. Human Dimensions Res. Unit Publ. 90-1. Dept. Nat. Resour., N.Y.S. Coll. Agric. and Life Sci., Cornell Univ., Ithaca. 29 pp.

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APPENDIX F

CHAPTER I, § 90

8 ILLINOIS ADMINISTRATIVE CODE

JANUARY 1, 1985

TITLE 8: AGRICULTURE AND ANIMALS
CHAPTER I: DEPARTMENT OF AGRICULTURE
SUBCHAPTER b: ANIMALS AND ANIMAL PRODUCTS

PART 90

ILLINOIS DEAD ANIMAL DISPOSAL ACT

Section

- 90.10 Plant Facilities
- 90.20 Plant Premises
- 90.30 Annual Truck Permits (Repealed)
- 90.40 Truck Operator's Records (Repealed)
- 90.50 Odors and Insects Shall Be Controlled
- 90.60 Salmonella Control for Renderers and Blenders
- 90.70 Inspection of Premise (Repealed)
- 90.80 Identification of Receptacles
- 90.90 Records (Repealed)
- 90.100 Transportation and Transactions (Repealed)
- 90.110 On-The-Farm Disposal
- 90.120 Collection Center
- 90.130 Disposal By Collection Center of Unusable Materials

(Source: Amended at 8 Ill. Reg.5937, effective April 23, 1984)

Section 90.110 On-The-Farm Disposal

Persons disposing of animals, poultry, fish, or parts of bodies thereof, other than to a licensed renderer, shall comply with the following:

- a) Disposal by Burning.
 - 1) No open burning will be permitted.
 - 2) Any disposal by burning must be performed with an incinerator that is in compliance with the Illinois Environmental Protection Act (Ill. Rev. Stat. 1983, ch. 111½, pars. 1001 et. seq.)
- b) Disposal by Burying.
 - 1) Location shall be in an area where runoff will not contaminate water supplies.
 - 2) Depth shall be sufficient to allow at least a six-inch compacted soil over the uppermost part of the carcass.
 - 3) The abdominal cavity of large carcasses shall be punctured to allow escape of putrefactive gasses.
 - 4) Lime or other chemical agent shall not be used to prevent decomposition.
 - 5) Precautions shall be taken at the site of burial necessary to prevent any disturbance by animal or mechanical means.
 - 6) If a disposal pit is employed for daily or routine deposits, there shall be minimum six-inch compacted soil cover after each deposit.

APPENDIX G

GOOD SAMARITAN FOOD DONOR ACT

AN ACT to limit liability of persons and organizations in connection with the donation of food for free distribution to needy persons and in connection with the distribution of such food. P.A. 82-580, approved and eff. Sept. 24, 1981.

2001. Short title

§ 1. This Act shall be known and may be cited as the "Good Samaritan Food Donor Act".

2002. Definitions

§ 2. For the purposes of this Act, unless the context otherwise requires, the terms defined in this Act have the meanings ascribed to them herein.

2002.01 Canned food

§ 2.01. "Canned food" means food that is commercially processed in hermetically sealed containers.

2002.02 Charitable organization

§ 2.02. "Charitable organization" is defined as set forth in Section 1 of "An Act to regulate solicitation and collection of funds for charitable purposes, providing for violations thereof, and making an appropriation therefor", approved July 26, 1963, as amended.¹

¹ Chapter 23, ¶ 5101.

2002.03. Farm product

§ 2.03. "Farm product" means any agricultural, dairy or horticultural product or any product designed or intended for human consumption or prepared principally from agricultural, dairy or horticultural produce.

2002.04. Commercially processed

§ 2.04. "Commercially processed" means processed in accordance with criteria of current good manufacturing practice as apply to facilities, methods, practices, and controls used by the commercial processor in the manufacture, processing or packing of low-acid foods in hermetically sealed containers in a manner adequate to protect the public health.

2002.05. Commercial processor

§ 2.05. "Commercial processor" includes any person engaged in commercial, custom, or institutional (church, school, penal or other organization) processing of food, including pet food.

2002.06. Hermetically sealed container

§ 2.06. "Hermetically sealed container" means a container that is designed and intended to be secure against the entry of microorganisms and thereby to maintain the commercial sterility of its content after processing.

2002.07. Not for profit corporation

§ 2.07. "Not for profit corporation" is defined as set forth in the "General Not for Profit Corporation Act",¹ except that the term does not include organizations which sell or offer to sell such donated items of food.

¹ Chapter 32, ¶ 163a et seq. (repealed; see, now, ch. 32, ¶ 101.01 et seq.).

2002.08 Perishable food

§ 2.08. "Perishable food" means any food having a significant risk of spoilage, loss of value, or loss of palatability within 90 days of the date of packaging.

2002.09. Gleaner

§ 2.09. "Gleaner" means a person that harvests for free distribution an agricultural crop that has been donated by the owners.

2002.10. Prepared food

§ 2.10. "Prepared food" means any food prepared, designed or intended for human consumption including, without limitation, those foods prepared principally from agricultural, dairy or horticultural produce or with meat, fish, or poultry.

Added by P.A. 84-134, § 1, eff. Jan. 1, 1986.

2002.11. Food producer

§ 2.11. "Food producer" includes, but is not limited to, restaurants, bakeries, cafeterias, caterers and delicatessens.

Added by P.A. 84-134, § 1, eff. Jan. 1, 1986.

2003. Immunity from liability--Donors

§ 3. (a) Except as provided in subsection (b), no farmer, food producer, processor, distributor, wholesaler, retailer, gleaner of food, or any other person (if that other person donates food that has been inspected by either a State or federal authority and has not been altered after that inspection), who in good faith donates perishable canned or farm food items or prepared food to a not for profit corporation or charitable organization for distribution to needy or poor persons shall be liable in any civil action based on the theory of warranty, negligence or strict liability in tort, for damages incurred resulting from any illness or disease contracted by the ultimate users or recipients of the food due to the nature, age, condition, or packaging of the food.

(b) The immunity provided in subsection (a) shall not apply where the following is shown:

(1) that the illness or disease resulted from the willful, wanton, or reckless acts of the donor; or

(2) that the donor had actual or constructive knowledge that the food was tainted, contaminated, or harmful to the health or well-being of the recipient of such donated food; or

(3) where the food was in the form of canned goods, that the containers were rusted, leaky, swollen, or otherwise defective to the extent that they could not be sold to members of the general public; provided, however, that the fact that the cans were simply dented does not, in itself, constitute such a defect so as to preclude the grant of immunity provided by subsection (a).

Amended by P.a. 86-704, § 3, eff. Jan. 1, 1990.

2004. Immunity from liability--Receipt of food for distribution--Not for profit corporations or charitable organizations

§ 4. (a) Except as provided in subsection (b), a not for profit corporation or charitable organization which in good faith receives food for free distribution and which reasonably inspects the food at the time of

donation and finds the food apparently fit for human consumption shall not be liable in any civil action based on the theory of warranty, negligence, or strict liability in tort, for damages incurred resulting from any illness or disease contracted by the ultimate users or recipients of the food due to the condition of the food.

(b) The immunity provided in subsection (a) shall not apply where the following is shown:

(1) that the illness or disease resulted from the willful, wanton, or reckless acts of the not for profit corporation or charitable organization; or

(2) that the corporation or organization had actual or constructive knowledge that the food was tainted, contaminated, or harmful to the health or well-being of the recipient of such donated food; or

(3) where the food was in the form of canned goods, that the containers were rusted, leaky, swollen, or otherwise defective to the extent that they could not be sold to the members of the general public; provided, however, that the fact that the cans were simply dented does not in itself, constitute such a defect so as to preclude the grant of immunity provided by subsection (a).

Appendix H: Vendors of deer damage abatement materials.

Exclusion Devices

- 1) Almac Plastics
6311 Erdman Avenue
Baltimore, Maryland 21205-3585
(301) 485-9100
*produces/sells various size plastic mesh; specific information on mesh sizes, thickness, and costs can be obtained by calling.
- 2) Dayton Bag and Burlap
322 Davis Avenue -OR- 210 Dowdle St., Unit#5
Dayton, Ohio 45403 Algonquin, IL 60102
(513) 258-8000 (708) 658-8488
" " -0029
(800) 543-3400
*many growers/homeowners have had success in preventing antler-rubbing damage to tree seedlings/saplings by securely wrapping the trunks with burlap. This company also sells "foam tree wraps" which may alleviate this type of damage.
- 3) Quadel Industries, Inc./Forest Protection Products
200 Troy Street
P.O. Box 1047
Coos Bay, Oregon 97420
(800) 289-7659
(503) 267-7351
*sells various sizes and strengths of netting for seedlings.
- 4) Tubex
P.O. Box 7097
Saint Paul, Minnesota 55107
(800) 248-8239
(612) 228-0535
*sells rigid plastic tubes for protecting individual seedlings/saplings.

Non-electric Fence Supplies

- 1) Bekaert Corporation
1395 Marietta Parkway
Building 500, Suite 100
Marietta, Georgia 30067
(800) 241-4126
*sells Gaucho Game Fence.
- 2) Grassland Supply
Rt. 3, Box 6
Council Grove, Kansas 66846
(800) 527-5487
(316) 767-5487
*also distributes the Gaucho Game Fence.

- 3) K Fence Systems
Rt. 1, Box 20
Zumbro Falls, Minnesota 55991
(507) 753-2943
- 4) Premier Fence Supplies
R.R. 1, Box 89
Washington, Iowa 52353
(800) 282-6631
(319) 653-6631
*sells high tensile woven wire.
- 5) Qual-line Fence Corp.
801 South Division Street
Waunakee, Wisconsin 53597
(608) 849-4654
*sells Bekaert-Gaucha Game Fence.
- 6) West Virginia Electric Fencing
U.S. Route 219
Lindside, West Virginia 24951
(800) 356-5458
(304) 753-4387
*sells "Tightlock Deer Fence".

Electric Fence Materials

- 1) Common Sense Fence
Division of GEOTEK, Inc.
2000 Highway 52 North
Chatfield, Minnesota 55923
(507) 867-3071
*sells 12.5 ga. electric wire and electric fiberglass "rail" fence materials.
- 2) Brookside Industries, Inc.
R.R. 1, Box 158
Tunbridge, Vermont 05077-9990
(800) 832-9482
(802) 889-3737
- 3) Dairyland Power Fence Co.
N3985 Hidden Valley Road
Hatley, Wisconsin 54440
(715) 446-2297
*sells Gallagher Power Fence materials.
- 4) Gallagher Power Fence, Inc.
P.O. Box 708900
San Antonio, Texas 78270-8900
(800) 531-5908
(512) 494-5211
*sells high-visibility electric "Polytape", "Turbo Tape", and "Dual Track 40mm Tape", as well as other electric fence materials.

- 5) Grassland Supply
R.R. 3, Box 48
Council Grove, Kansas 66846
(800) 527-5487
(316) 767-5487
- 6) K Fence Systems
(listed on previous page)
- 7) Kiwi Fence Systems, Inc. -OR- Glascock Equip. & Sales
R.D. #2, Box 51A R.R.#2
Waynesburg, Pennsylvania 15370 Veedersburg, IN 47987
(412) 627-5640 or 627-8158 (317) 294-2256
*sells high tensile and "Spider" fences.
- 8) Margo Supplies, Ltd.
R.R. 6, Site 20, Box 11
Calgary, Alberta T2M 4L5, Canada
(403) 285-9731
- 9) Multi-Tech Industries, Inc. Techfence Advanced Farm
Techfence Division Systems, Inc.
64 S. Main St., P.O. Box OR R.R. 1, Box 45
Marlboro, New Jersey 07746 Elroy, Wisconsin 53929
(908) 431-0550 (608) 462-5771
*there are no qualified Techfence contractors/dealers in this area.
- 10) Premier Fence Supplies
(listed on previous page)
*also sells high tensile, "QuikFence", and "Hot Tape" electric fence materials.
- 11) Shock Tactics Electric Fence Systems
Waterford Corporation
404 North Link Lane, P.O. Box 1513
Fort Collins, Colorado 80522
(800) 525-4952
(303) 482-0911
- 12) West Virginia Electric Fencing
(listed on previous page)
*sells high tensile, "Lite Fence", "Fast Fence", & "Hot Tape".

Deterrents/Frightening Devices: users must contact their local Illinois Dept. of Conservation office to determine if permits are required before using the following materials.

- 1) Bird-X, Inc.
730 West Lake Street
Chicago, IL 60606
(800) 662-5021

(312) 648-2191

*sells BirdGard Electronic Bird Repeller (repels animals with loud bird distress calls).

1) Chesapeake Importing & Distributing Co./CIDCO

21480 Pacific Blvd.

Sterling, VA 22170

(703) 450-1900

*sells 12ga. rubber deterrent ammunition.

2) Margo Supplies, Ltd.

(listed above)

*ZON Scare Guns, bangers/screamers/whistlers, etc.

3) Reed-Joseph International Co.

P.O. Box 894 - 232 Main St.

Greenville, Mississippi 38701

(800) 647-5554

(601) 335-5822

*sells "Scare-Away devices" (bangers, screamers, propane cannons, etc.).

4) Mr. Robert Royal, Dealer

P.O. Box 108

Midnight, Mississippi 39115

(601) 247-4403

*sells automated scarecrow = "Scarey Man" Fall Guy.

4) Smith-Roles

Box 1607

Minot, North Dakota 58702

(701) 852-3726

4) Stoneco, Inc.

P.O. Box 765

Trinidad, Colorado 81082

(719) 846-2853

(Shell Crackers, Fuse Rope Salute, etc.)

5) Mr. Tom Demkin

Tomko Enterprises, Inc.

180 Merritt's Pond Road

Riverhead, New York 11901

(516) 727-3932

(Tomko "Clapper")

Repellents (several of the local nurseries, hardware stores, and discount stores in NE Illinois sell some of the repellents listed below)

Ani-pel tablets & topical spray (patent pending)

1) Ani-pel Silviculture Ltd./T.S. Research Ltd.

13550 106th Avenue

Surrey, British Columbia, Canada

V3T 2C5

(604) 585-7161

(Ani-pel and Ani-pel Plus Tablets are slow release repellents taken up by the roots of plants. They are not designed for use on fruit-bearing plants).

Deer Away/Big Game Repellent (putrescent whole egg solids)

- | | |
|---|--|
| 1) IntAgra, Inc.
8500 Pillsbury Avenue South
Minneapolis, Minnesota 55240
(800) 468-2472
(612) 881-5535 | <u>Local Distributor</u>
Reidesigne Garden Ctr.
Route 176
Grayslake, IL
(815) 675-6007 |
| 2) Margo Supplies, Ltd.
(listed on previous page) | |

Hinder (ammonium soaps of higher fatty acids)

- | | |
|---|--|
| 1) Leffingwell Division
Uniroyal Chemical Co.
111 S. Berry St.
P.O. Box 1880
Brea, California 92621
(800) 262-3861
-Local Sales Representative
Ken Zielinski
(517) 349-7144 | <u>Local Distributors</u>
a) Hunt Supply
St. Joseph, MO
(816) 233-4011

b) United Suppliers
Eldora, IA
(515) 858-2341 |
| 2) Voluntary Purchasing Groups, Inc.
Garden Supply Dept.
Bonham, Texas
(903) 583-5501 | <u>Local Distributor</u>
C.D. Ford & Sons
Geneseo, IL
(309) 944-4661 |

Hot Sauce Animal Repellent (capsaicin)

- | | |
|--|---|
| 1) Miller Chemical and Fertilizer Corp.
P.O. Box 333, Radio Road
Hanover, Pennsylvania 17331
(717) 632-8921 | <u>Local Distributor</u>
Mr. Dean Konieczka
McHenry, IL
(815) 363-9781 |
|--|---|

Magic Circle Deer Repellent (bone tar oil)

- 1) State College Laboratories
Subsidiary of J. C. Ehrlich Chemical Co., Inc.
840 William Lane
Reading, Pennsylvania 19612-3848
(800) 422-8159
(215) 921-0641

Insecticide Fumigant sometimes used as deer repellents (naphthalene)

- 1) Sudbury Lawn and Garden Products
Division of Farnam Companies, Inc.
301 West Osborn -OR- P.O. Box 34820
Phoenix, Arizona 85013-3938 Phoenix, AZ 85067
(800) 343-9911 or (602) 285-1660

(= squirrel and bat repellent)

Ro-pel {benzyl diethyl [(2,6 xylylcarbonyl) methyl] ammonium saccharide (0.065%),
thymol (0.035%)}

- | | |
|--|---|
| <ol style="list-style-type: none">1) Burlington Scientific Corp.
222 Sherwood Avenue
Farmingdale, New York 11735-1527
(516) 694-9000 | <u>Local Distributor</u>
Several in Illinois
Lake-Cook Farm Supply
P.O. Box 1308
Palatine, IL 60078
(708) 991-4800 |
|--|---|

Thiram

- | | |
|--|---|
| <ol style="list-style-type: none">1) Bonide Chemical Co.
2 Wurz Avenue
Yorkville, New York 13495
(315) 736-8231
(Rabbit-Deer Repellent & Bulb Saver)2) Gustafson, Inc.
P.O. Box 660065
Dallas, Texas 75266-0065
(214) 985-8877
(815) 968-3113
- or -
1400 Preston Rd., Suite 400
Plano, Texas 75093
(Gustafson 42-S)3) Nott Manufacturing Co.
P.O. Box 685
Pleasant Valley, New York 12569
(914) 635-3243
(Chew-Not) | <u>Local Distributor</u>
The Val-A Company
700-710 W. Root St.
Chicago, IL 60609
(312) 927-9442

<u>Local Distributor</u>
Terra International
8401 W. State St.
Rockford, IL 61105 |
|--|---|

4) Southern Mill Creek Products Co.
P.O.Box 1096
5414 N. 56th St.
Tampa, Florida 33601
(813) 626-2111
(Science Rabbit & Deer Repellent)

Local Distributor

List available upon request.

5) Sudbury Lawn and Garden Products
(listed on previous page)
(Chaperone Rabbit & Deer Repellent)

Local Distributor

Olsen Distributors
969 N. Pepper Rd.
Barrington, IL 60010
(708) 381-9333

6) Wilbur-Ellis Co.
P.O. Box 1286
Fresno, California 93715
(209) 442-1220

(Scram 42-S)

Local Distributor

Brayton Chemical Co.
P.O. Box 437
W. Burlington, Iowa 52655
(319) 752-6324

Updated Spring 1991 by: J.M. Jones
Urban Deer Project
Illinois Dept. of Conservation

STATE OF ILLINOIS

PROJECT NO.: W-105-R

STUDY VII: Population Studies and Restocking of Ruffed Grouse in Illinois

A. Problem:

The Department of Conservation needs to evaluate existing grouse populations on a statewide basis. The Illinois Ruffed Grouse Project requires further evaluation of past stocking problems, identification of existing habitat, determination of grouse habitat needs specific to Illinois. Sources of grouse for restoration efforts need to be developed with surrounding states and trade agreements with Minnesota are in need of renegotiation.

B. Objective:

To restore viable populations of ruffed grouse to its historic Illinois range, where suitable habitat exists.

C. Justification:

The main function of the Ruffed Grouse Project is to restore a once native species to the State of Illinois. Annual drumming and sighting card surveys will assist in determining the current status of grouse, reason for past stocking problems, identification of productive habitats, and identification of range expansion. Monitoring release sites should improve the manager's ability to enhance chances for the successful restoration of grouse in Illinois.

To continue the reintroduction of grouse in suitable areas throughout the state requires a source of ruffed grouse. Therefore, agreements with states that have a surplus of grouse must be developed and negotiated.

D. Status:

Native populations of ruffed grouse declined drastically in the late 1800's and early 1900's. A single grouse sighting in 1937 in Pope County was the last time ruffed grouse was recorded in Illinois prior to the Department of Conservation restoration efforts.

From 1953 to 1959, Illinois made several attempts to reestablish grouse in the southern part of the state. During this period, slightly more than 300 grouse were obtained from Wisconsin and

Michigan and released in Pope county. Scattered sightings were reported in four southern Illinois counties up to 1963. The very low densities occurring in this grouse population are attributed to the affect of too great a change in habitat and climate into which the birds were introduced. Since there were no known sightings of ruffed grouse in southern Illinois from 1964-67, the Illinois Department of Conservation initiated a further attempt to reintroduce grouse in the fall of 1967. A total of 31 wild trapped ruffed grouse were obtained from southern Ohio and released at a single location in Pope County. During September of 1972, we obtained 42 ruffed grouse from Indiana through a mutual trade agreement. These birds were released in the northern part of Alexander County. Drumming grouse were last documented in these counties during the spring of 1991. These populations persist at low densities.

In 1982 and 1983 grouse releases of 120 and 22 Indiana birds respectively commenced in Shawnee National Forest, Union County. A follow-up release occurred in 1986 with the liberation of 71 Indiana grouse. During the 1993 drumming surveys, a total of 6 grouse were heard, these birds persist in close association with clearcut areas. The minimal success of this release is thought to be caused by the lack of sufficient habitat for the birds to disperse into.

In an effort to establish grouse in a new area of the state, releases were conducted in Jo Daviess County. From 1989 to 1992, 181 Minnesota grouse have been released in the west central portion of the county. The Department's latest drumming surveys (1994) located 4 birds.

Trade agreements with other states historically were composed of 3 grouse for 1 wild turkey. Currently, all contracts have been completed. However, Minnesota is willing to renew a ruffed grouse/wild turkey trade. The development of trades with other states are presently unlikely due to a low in grouse population cycles.

The Department has learned from past releases several factors that lead to very low grouse densities. By utilizing newfound knowledge pertaining to the habitat preference of the grouse and required number of birds for a release, the probability that grouse can maintain a viable population at new release sites has been enhanced. Initial habitat analyses have located several sites with the characteristics that are conducive for grouse.

E. Procedures:

Job VIIA Ruffed Grouse Drumming Surveys

Objective: To evaluate survival, dispersal, and reproductive productivity of reintroduced ruffed grouse.

Abstract 1994 Segment:

During April of 1994, IDOC personnel surveyed the ruffed grouse populations within Jo Daviess County. All drumming surveys were conducted from one-half hour before sunrise to approximately 8:30 a.m. The driving census routes consisted of 11 or 12 predetermined listening points about one-half mile apart, along a route approximately 6 miles in length. Walking surveys were 2 or 3 miles long, with listening stops at approximately one-quarter mile intervals. All survey participants were instructed to listen at each stop for a 4 minute time interval.

During April 19-22 a total of 14 driving survey routes and 8 walking survey routes were conducted. The weather conditions were favorable for hearing drumming activities during the entire survey period. The wind was calm and sky clear for nearly all drumming surveys. Six driving routes were run on 2 consecutive days in the ruffed grouse release areas. One walking route was conducted along the Galena River. Two driving surveys were run in the Apple River Canyon Area. And 6 walking routes were conducted in a 1,000 acre sample plot which lies within the grouse release area.

The surveys resulted in the documentation of 4 drumming males. Two birds were located during the driving routes in the grouse release area and investigators located 2 birds in the 1,000 acre plot. The intent of the surveys was to document the existence of grouse and obtain a population trend index in Jo Daviess County. The Galena River routes were established during 1994 to determine if grouse are expanding into new areas. The other new routes in the Apple River Canyon were created to verify the existence of a possible remnant grouse population. Unfortunately, no grouse were located on the newly established routes. To obtain quantitative information on specific grouse population densities, an intensive survey was conducted on a 1,000 acre plot. The intent was to locate all drumming males. A total of 3 drummers were located (2 birds during the 1,000 plot sampling, 1 bird from the driving survey). From this information, the population density was estimated at approximately 1 grouse/100 acres. This estimation is a conservative, minimum spring density of birds of both sexes, which was derived by assuming a 1:1 sex ratio and the existence of non-drumming males. The number of drumming males counted was doubled and expressed as birds/100 acres.

Although the 1994 figure is lower than the previous reporting period (4 drumming grouse - 1994 v.s. 6 drumming grouse - 1993); it is difficult to state that a downward trend exists in the population because of the small sample size and relatively small decrease in drumming males. Due to the short time frame and small area that drumming surveys are conducted, a high probability exists that investigators miss a number of drumming males. The Jo Daviess grouse population requires further study to ascertain a more complete analysis.

Costs: \$7,320.00

Summary:

Ruffed Grouse drumming surveys were conducted on an annual basis in Jo Daviess County, throughout the entire reporting period. In southern Illinois (Union and Pope Counties), census routes were conducted during the entire period with the exception of 1994. During this segment, the southern Illinois drumming surveys were not conducted; because of a lack of manpower and monetary constraints. It was also felt that conducting surveys every other year would be sufficient to assess these grouse populations. The drumming survey information was sufficient to determine the relative status of ruffed grouse on a statewide basis. The drumming survey work indicates that within Illinois, the ruffed grouse populations remain at low densities.

Job VIIB Evaluation of Potential Grouse Release Sites

Objective: To determine new release sites for grouse by locating and evaluating habitat types with an early forest successional stage composition.

Abstract 1994 Segment:

Habitat analysis for this segment was limited to several field visits and the development of a timber buyers survey. Departmental personnel evaluated several privately owned properties in Jersey and Fulton Counties. Several properties located in Jersey contained desirable habitat conducive for a ruffed grouse release site. The Fulton County areas lacked sufficient early successional stage habitat necessary for grouse management. To assist in locating timber harvest activities a timber buyers survey was drafted. By identifying cut over areas, wildlife biologists can locate potential areas that contain suitable grouse habitat. The survey is currently in a developmental format. Upon completion, the survey will be sent to timber buyers throughout the state.

Costs: \$11,713.00

Summary:

During the reporting period, habitat evaluation centered around Jo Daviess County; because of the ruffed grouse releases which occurred in this area during 1989-1992. Once the releases were completed a greater emphasis was placed upon a statewide perspective. This trend will continue and accelerate, when the implementation of the Illinois Ruffed Grouse Management Plan occurs.

It is recommended that habitat evaluation and identification of potential ruffed grouse release sites continue. The entire process of evaluating ruffed grouse habitat on a statewide basis

is not complete. Future efforts should focus on west-central, northwestern, and southern Illinois, because these regions contain the majority of forested habitat. Potential grouse release sites should be prioritized, based on habitat size, quality, distribution, and current management to facilitate decision-making processes and ensure successful releases.

Job VIIC Coordination of Ruffed Grouse Releases

Objective: To obtain and release ruffed grouse in suitable habitat. This will include renewal and development of agreements with surrounding states to obtain wild-trapped ruffed grouse. Contracts should be developed with other states which are mutually beneficial, such as trade agreements. It will also include all activities related to obtaining and releasing grouse.

Abstract 1994 Segment:

Ruffed grouse releases were not conducted during this segment. Therefore, the provisions of Job VIIC were not utilized.

Costs: \$14,640.00

Summary:

The Jo Daviess County grouse release was completed during this reporting period. A total of 181 grouse were released in this county from 1989-1992. Additional releases are pending upon the completion of a statewide habitat evaluation, which will determine new grouse release sites. When the habitat analysis is complete, renegotiation of trade agreements should follow, to ensure a source of ruffed grouse for future restoration efforts. To assess the possibility of securing grouse for release, a telephone survey was conducted during the summer of 1992. The findings indicated that Minnesota was the only viable option for negotiating a trade agreement. The other surrounding states were not interested in providing ruffed grouse to Illinois.

Job VIID Radio Telemetry Study of Reintroduced Ruffed Grouse in Illinois

Objective: To evaluate the dispersal, habitat utilization, and productivity of newly-reintroduced ruffed grouse populations.

Cost: \$2,000.00

Summary:

This study was not utilized during the entire reporting period. The main reasons for not accomplishing the objective were lack of personnel availability and materials to conduct the

investigation. The study should be reinstated in the event that a new grouse release is established.

Job VIIIE Ruffed Grouse Sighting Card Survey

Objective: To determine productivity, population expansion, and habitat utilization of grouse through the use of sighting card surveys in regions where grouse releases have occurred.

Abstract 1994 Segment:

During the 1994 segment, ruffed grouse sighting cards started being disseminated to the public by Forest Wildlife Project Managers, District Wildlife Biologists, and Private Lands Biologists. This survey is still in the developmental stages and the cards have not been in existence long enough to meet the objective.

Costs: \$2,100.00

Summary:

The sighting card survey was initiated during 1993. The card was designed, sent out for review, accepted, and printed during that segment. Although some cards have been distributed to the public, returns are slow in coming back to the Forest Wildlife Program. The distribution must be modified so that public access to the sighting cards improves. This survey is important because it allows wildlife biologists to evaluate grouse populations throughout the state and the year. This information will assist in developing a comprehensive data base which will enhance the Department's ability to manage ruffed grouse on a statewide basis.

STATE OF ILLINOIS

PROJECT NO.: W-105-R

STUDY IV: Mast Survey

A. Problem:

Mast is a staple source of food of many of Illinois' wildlife species. The quantity and quality of mast in Illinois are subject to the vagaries of local weather conditions particularly in the spring months when the oaks and hickories are subjected to below-freezing temperatures during the flowering stage. Such weather phenomena are sporadic in nature and do not affect the entire state. A system is needed that will enable the Department to monitor mast conditions annually at various localities in the state.

B. Objective:

To annually measure the kind and quantity of mast at various locations in the state.

C. Justification:

It has been demonstrated that the quantity of mast, primarily oaks and hickories is correlated with squirrel production the subsequent year. It is important for wildlife managers to have information annually on the quantity of mast available.

D. Status:

District Wildlife Managers have annually measured mast conditions at some public sites in Illinois since the mid-1970s. Currently mast surveys are conducted on the following sites that are opened to public hunting: Moraine View, Pere Marquette, Big River, Ramsey Lake, Stephen A. Forbes, Sam Parr, Fern Clyffe, Siloam Springs, Randolph County, Kankakee River, Sand Ridge, Spring Lake, Castle Rock and Big Bend (Fig. 1).

E. Procedures:

Job VIA Survey of Mast Production

Objective: To measure the annual status of mast available on certain public hunting areas.

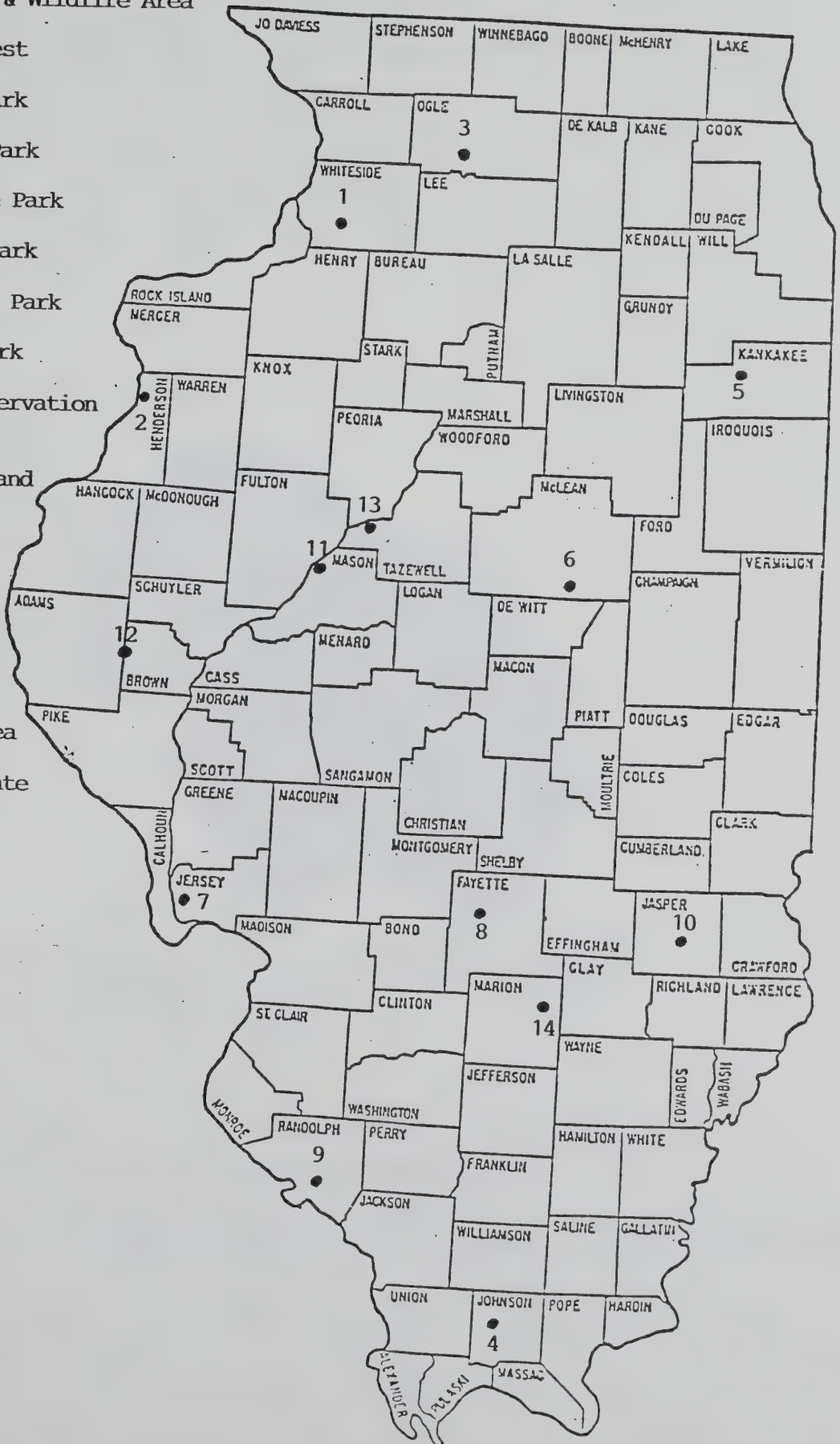
From 1989-1991 the study was conducted on select state sites. District Biologists surveyed a variety of mast producing tree species at each site. This information was analyzed by the

Forest Wildlife Program for trends in statewide mast production and in a predictive capacity to anticipate squirrel population productivity.

Due to a number of factors the decision was made to discontinue the study in 1991. Statewide squirrel populations remained numerous and healthy; therefore, the mast survey was thought unnecessary to monitor squirrel population trends. The Department also felt the information was not utilized extensively enough to justify the expenditure of money and manpower to continue the surveys.

MAST SURVEY SITES

- 1) Big Bend State Fish & Wildlife Area
- 2) Big River State Forest
- 3) Castle Rock State Park
- 4) Ferne Clyffe State Park
- 5) Kankakee River State Park
- 6) Moraine View State Park
- 7) Pere Marquette State Park
- 8) Ramsey Lake State Park
- 9) Randolph County Conservation Area
- 10) Sam Parr State Fish and Wildlife Area
- 11) Sand Ridge State Forest
- 12) Siloam Springs State Park
- 13) Spring Lake State Fish & Wildlife Area
- 14) Stephen A. Forbes State Park



FINAL REPORT

SURVEYS AND INVESTIGATIONS PROJECTS

As Required By

FEDERAL AID IN WILDLIFE RESTORATION ACT

ILLINOIS

Federal Aid Project W-105-R(5)

STUDY II: POPULATION STUDIES OF WILD TURKEYS

Job IIB: Turkey Population Data from Harvest

Job IIC: Hunting Pressure and Harvest Analysis

By

Jared K. Garver
Forest Wildlife Biologist



Brent Manning, Director

Jeffrey M. Ver Steeg, Supervisor, Division of Wildlife Resources

ILLINOIS DEPARTMENT OF CONSERVATION

Mike Sweet
P-R Coordinator

John Buhnerkempe, Supervisor
Forest & Grassland Wildlife Section

Paul Shelton, Program Mgr.
Forest Wildlife Program

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FINAL REPORT
SURVEYS AND INVESTIGATIONS PROJECTS

STATE OF ILLINOIS

PROJECT NO: W-105-R(5)

STUDY II: POPULATION STUDIES OF WILD TURKEYS

Job IIB: Turkey population data from harvest

Job IIC: Hunting pressure and harvest analysis

ABSTRACT: Illinois had its 25th wild turkey season from April 4 through May 11, 1994. Hunters were allowed to kill one gobbler or bearded hen per permit with a maximum of 3 permits. The state was divided into Northern and Southern Zones with the Southern Zone opening 1 week earlier than the Northern. The 31 day season was subdivided into 4 separate seasons of 5, 6, 8 and 12 days in length with different hunters each season. Mandatory check stations were maintained in each county throughout the season. A total of 5,519 wild turkeys were harvested in the 50 open counties. Hunter success averaged 19.9% statewide. Juveniles made up 45.9% of the harvest.

Illinois had its 10th fall archery either-sex season from October 1 through January 13, 1994. Hunters were allowed to kill one turkey of either sex. A total of 88 turkeys were harvested in the 45 open counties. Hunter success was 1.8%.

Illinois had its fifth fall firearm either-sex turkey season from October 16 through October 24, 1993. Hunters were allowed to kill one turkey of either-sex. A total of 684 turkeys were taken in the 19 open counties. Hunter success averaged 20.3% statewide.

FINAL REPORT

SURVEYS AND INVESTIGATIONS PROJECT

STATE OF ILLINOIS

PROJECT NO: W-105-R(5)

STUDY II: POPULATION STUDIES OF WILD TURKEYS

Objective: To determine population trends and characteristics of the wild turkey in Illinois.

Job IIB: Turkey population data from harvest

Job IIC: Hunting pressure and harvest analysis

Objective: To determine the annual harvest of wild turkeys and to characterize the population by gathering data at mandatory check stations.

Procedures: Mandatory wild turkey check stations were set up in each county or counties open to turkey hunting during the spring and fall firearm seasons. These stations were open from 7 a.m. to 2 p.m. during each day of the spring season. During the fall season, check station hours were 8 a.m. to 7 p.m. Successful hunters were required to bring their whole turkey to the check station on the same day as they killed it.

During the spring season, check station operators gathered the following data from each turkey and hunter: age, sex, whole weight, beard length, spur length, # days hunted, # birds heard, # birds seen, # bobcats seen, # birds crippled, type of weapon used and # years the hunter has hunted turkeys. During the fall season, all of the above data was collected except for the # of birds heard, type of weapon used and # of years the hunter has hunted turkeys.

To show our appreciation for their cooperation, each successful hunter was given a brass pin, depicting the State, with a turkey and the year engraved on the front.

Hunter success was calculated from the data using the formula:

$$\text{Hunter Success} = \frac{\text{Total Number of Turkeys Checked}}{\text{Total Number of Permits Issued}}$$

Hunter success was determined for each season by county (Tables 1 & 8) and by day (Tables 3 & 9).

The physical data on harvested turkeys (Table 4) is for gobblers only.

During the fall archery season, successful hunters were required to report kills, with requested supplementary data, in postage paid envelopes which were provided with their permits. The data collected included sex, age, county of kill and the number of hunting trips completed during the season. Hunters were asked to submit a breast feather and the outer 1/3 of the last two primary wing feathers (Figure 2).

Findings and
Analysis:

SPRING SEASON

Illinois held its 25th spring wild turkey season from April 4 through May 11, 1994. The state was divided into Northern and Southern Zones with the Southern Zone opening 1 week earlier than the Northern Zone. The overall season was subdivided into three separate seasons with different hunters each season. Hunters were allowed to kill one gobbler or one bearded hen per permit with a maximum of three permits. After an initial lottery drawing and a first-come, first-served application period, any remaining permits were made available as second permits. The counties of Adams, Alexander, Bond, Brown, Bureau, Calhoun, Carroll, Cass, Clark, Clay, Cumberland, Effingham, Fayette, Fulton, Gallatin-Hardin, Greene, Hancock, Henderson, Jackson, Jersey, JoDaviess, Johnson, Knox, Lee, Macoupin, Marshall-Putnam, Marion, Mason, McDonough, Mercer, Monroe, Morgan, Ogle, Pike, Pope, Randolph, Rock Island, Saline, Schuyler, Scott, St. Clair, Stephenson, Tazewell, Union, Washington, Whiteside, Williamson and Winnebago were open to hunting.

Hunters were required to hunt in a one or two county area only. Each county or two-county area had a permit quota for each of the four seasons. A total of 22,477 permits were issued during the initial lottery drawing and during the first-come, first-served application periods as first, second or third permits. A total of 5,249 landowner permits were issued for an overall total of 27,726 permits. This represents an 11% increase in number of permits over 1993 when 24,889 permits were issued.

A total of 5,519 wild turkeys were harvested during the 1994 season (Table 1). Bearded hens (140) made up 2.5% of the total harvest. This represents a 19% increase in the harvest over 1993 when 4,632 turkeys were bagged (Table 5). JoDaviess County hunters led the way with a kill of 541 followed by Pike County hunters with a kill of 322. This is the highest recorded kill since Illinois started its modern turkey season in 1970.

Juveniles made up 46% of the harvest in 1994, as compared to 34% of the harvest in 1993. Juveniles made up 45% of the kill in 1992 and 33% in 1991. This juvenile segment of the harvest is a direct correlation of the previous year's reproductive success. Brood survey data from 1991 indicated average reproduction in Illinois while in 1990 reproduction was below average. Reproduction in 1992 was below average and below average in 1993. This harvest data supports our reproductive data. This direct comparison does not seem to hold true in counties first opened to hunting. This is because of an excess of adult gobblers that have not been "wised-up" by previous hunting.

Hunter success ranged from a high of 34.4% in Scott County to a low of 9.7% in Clark County. The statewide hunter success was 19.9% as compared to 18.7% in 1993. Hunter success was 24.1% during the first season, 19.1% for the second season, 18.7% for the third season, and 17.7% for the fourth season. Hunter success was 44.1% for Morgan County during the second season. This was the highest recorded for all four seasons (Table 1).

Over the entire 50 county area, 1.04 turkeys were harvested per square mile of forest (Table 2). On a county basis, the harvest ranged from a high of 4.60/square mile in JoDaviess County to a low of 0.12/square mile in Clark County.

Statewide, hunters heard an average of 2.3 turkeys per day of hunting (Table 4) as compared to 1993 when they heard 2.5 birds per day. They also saw an average of 2.2 turkeys daily in 1994. In 1993, hunters also reported seeing 2.2 turkeys per day of hunting. The timing of the 1994 spring turkey season was good.

The chronology of the harvest was as expected with a fairly general daily decline after opening day (Table 3a & 3b). This general decline varies

somewhat because of weather and the amount of hunter participation. During the first 5 day season, 30% of the harvest was taken, with opening day accounting for 9.6% of the total harvest. This is explained by the accumulative effects of hunting pressure and by the accepted assumption that "spooked" turkeys are more difficult to bag.

Successful hunters reported a 2.5% crippling loss in 1994. I suggest that this reported loss is considerably lower than the real loss. Many hunters seem to be hesitant about admitting to crippling a turkey. Of course, many hunters are completely honest in reporting the results of their hunt. In a small group of personally known successful turkey hunters in Southern Illinois, each having killed 30 to 60 wild turkeys, their crippling loss is about 10%. I have no reason to believe that a very experienced and successful turkey hunter's crippling loss would be any higher than our average hunter's losses, in fact, it should probably be lower. In Virginia, the crippling loss amounted to 10% of the number bagged and recovered (Mosby and Handley, 1943). South Carolina estimated a 20% crippling loss on managed gobbler hunts (Shaffer and Gwynn, 1967).

Wild turkeys have great vitality, therefore, well placed shots are essential to prevent crippling loss. Since the turkey is larger than most shotgun game, it is frequently shot when too far away. Many of these "cripples" probably recover totally from their wounds.

FALL ARCHERY SEASON

Illinois had its 10th fall archery either-sex turkey season from October 1, 1993 through January 13, 1994. A total of 4,813 permits were issued for the 45 counties that were open to hunting. Hunters were allowed to hunt in any of the open counties. There was no quota on the number of permits issued.

A total of 88 turkeys were reported killed for a hunter success rate of 1.8% (Table 7). The harvest was composed of 18 adult males (20.5%), 23 juvenile males (26.1%), 16 adult females (18.2%), 21 juvenile females (23.9%) and 10 unknowns (11.4%).

Of the 88 successful hunters, 40 made less than 5 hunting trips, 17 made 6-10 trips, 6 made 11-15 trips, 19 indicated that they hunted more than 15

times and 6 did not report the number of hunting trips.

During the 3 1/2 month long season, hunters killed 46 (52.3%) of the birds in October, 19 (21.6%) in November, 12 (13.6%) during December and 11 (12.5%) during January.

FALL FIREARM SEASON

Illinois held its fifth fall firearm turkey season from October 16 through October 24, 1993. Hunters were allowed to take one turkey of either sex. The counties of Adams, Alexander, Brown, Calhoun, Carroll, Gallatin, Greene, Hancock, Hardin, Jackson, Jersey, JoDaviess, Pike, Pope, Randolph, Saline, Schuyler, Union and Williamson were open to hunting.

Hunters were required to hunt in a one or two county area only. Each county or two-county area had a permit quota for the season. A total of 2,441 permits were issued during the initial lottery drawing and the first-come, first-served application periods. An additional 933 landowner permits were issued for an overall total of 3,374 permits which is 10.1% lower than the 1992 total of 3,752 permits.

A total of 684 wild turkeys were harvested during the 1993 fall season (Table 8). This is 12.1% lower than the 1992 harvest of 778 birds. JoDaviess County led the way with a kill of 181 followed by Schuyler County with a kill of 94 and Pike County with 53 birds.

Hunter success ranged from a high of 32.4% in JoDaviess County to a low of 11.1% in Saline County. The statewide hunter success was 20.3% in 1993 compared to 20.7% in 1992.

Adult males (99) made up 14.5% of the harvest. Juveniles males (237) made up 34.6%, adult females (172) made up 25.1% and juvenile females (176) made up 25.7% of the total harvest (Table 8). The juvenile segment of the harvest (60.3%) is about what was expected since reproduction in 1993 was below average. In 1992, when reproduction was also below average, juveniles made up 56.8% of the harvest.

The chronology of the harvest was as expected with a fairly general daily decline after opening day (Table 9). The first two days and the last two days occurred on weekends. The increase in hunter participation for the second weekend resulted in an increase in the harvest for these last two days. Opening day accounted for 25.7% of the total kill, with opening weekend accounting for 42.5% of the kill.

Statewide, hunters saw an average of 5.3 turkeys per day of hunting (Table 10). This compares to 1992 when hunters reported seeing 4.8 turkeys per day of hunting. This varied from a high of 9.7 turkeys per day in Hancock County to a low of 2.5 turkeys per day in Greene and Williamson counties. Successful hunters averaged 2.5 days of hunting during the 1993 fall season as compared to 2.6 days in 1992.

Successful hunters reported a 2.8% crippling loss during this fall season as compared to a 2.1% crippling loss during the 1992 fall season. As in the spring, this reported loss is probably considerably lower than the real loss.

Recommendations: Mandatory county check stations during the fall firearm and spring seasons should be continued. This has proven to be the most reliable method for gathering accurate harvest data. No major changes in the type of data collected is necessary.

In 1988, to reduce hunter densities and to provide additional permits, we expanded our spring turkey season from one 12-day season to three separate seasons spanning a total of 24 days. For 1993, we added a fourth season with an expansion in total hunting days to 31. In spite of increasing numbers of hunters and hunting opportunities, the reduction in hunter densities with multiple seasons has undoubtedly contributed to the reduction in hunter shooting accidents from 5 in 1987 to 0 in 1988, 0 in 1989, 0 in 1990, 3 in 1991, 2 in 1992, 0 in 1993, and 0 in 1994.

Literature Cited: Mosby, H.S. and C.O. Handley, 1943. The Wild Turkey in Virginia: Its Status, Life History and Management. Va. Comm. Game and Inland Fisheries, Richmond. 281pp.

Shaffer, C.H. and J.W. Gwynn, 1967. Management of the Eastern Turkey in Oak-Pine and Pine Forests of Virginia and the Southeast. In the Wild Turkey and Its Management. Pp 303-342. Wildlife Society, Washington. 589pp.

Data and Reports: Original data and related reports in this investigation are on file in the Division of Wildlife Resources office of the Illinois Department of Conservation, Union County Refuge, Jonesboro, Illinois 62952.

Table1. 1994 Spring Turkey Season Results

COUNTY	1st Season			2nd Season			3rd Season			4th Season			All Seasons				
	Permits Issued	Birds Harvested	Hunter Success	Permits Issued	Birds Harvested	Hunter Success	Permits Issued	Birds Harvested	Hunter Success	Permits Issued	Birds Harvested	Hunter Success	Free Landowner Permits	Paid Permits	Total Permits	Birds Harvested	Hunter Success
Adams	323	87	26.9	323	68	21.1	322	62	19.3	322	55	17.1	350	940	1290	272	21.1
Alexander	151	24	15.9	145	13	9.0	150	15	10.0	97	14	14.4	42	501	543	66	12.2
Bond	65	12	18.5	65	10	15.4	46	9	19.6	60	10	16.7	40	196	236	41	17.4
Brown	213	72	33.8	222	61	27.5	222	46	20.7	221	37	16.7	247	631	878	216	24.6
Bureau	71	15	21.1	72	15	20.8	57	5	8.8	69	10	14.5	44	225	269	45	16.7
Calhoun	228	70	30.7	227	62	27.3	227	62	27.3	227	76	33.5	369	540	909	270	29.7
Carroll	228	72	31.6	228	39	17.1	228	48	21.1	228	38	16.7	112	800	912	197	21.6
Cass	111	35	31.5	112	29	25.9	111	20	18.0	111	35	31.5	84	361	445	119	26.7
Clark	44	7	15.9	49	4	8.2	29	1	3.4	54	5	9.3	19	157	176	17	9.7
Clay	106	21	19.8	105	12	11.4	105	13	12.4	105	20	19.0	121	300	421	66	15.7
Cumberland	60	13	21.7	60	6	10.0	60	8	13.3	60	8	13.3	40	200	240	35	14.6
Effingham	106	15	14.2	107	9	8.4	107	14	13.1	106	15	14.2	107	319	426	53	12.4
Fayette	97	14	14.4	97	6	6.2	75	7	9.3	89	12	13.5	67	291	358	39	10.9
Fulton	140	25	17.9	138	16	11.6	139	18	12.9	139	18	12.9	117	439	556	77	13.8
Gallatin-Hardin	233	38	16.3	234	28	12.0	233	26	11.2	232	23	9.9	92	840	932	115	12.3
Greene	141	36	25.5	141	57	40.4	141	32	22.7	140	30	21.4	163	400	563	155	27.5
Hancock	217	66	30.4	217	67	30.9	217	47	21.7	216	32	14.8	267	600	867	212	24.5
Henderson	118	32	27.1	117	34	29.1	117	44	37.6	117	27	23.1	70	399	469	137	29.2
Jackson	290	68	23.4	288	25	8.7	288	45	15.6	288	26	9.0	113	1041	1154	164	14.2
Jersey	243	47	19.3	243	71	29.2	242	44	18.2	242	46	19.0	230	740	970	208	21.4
JobDaviss	570	158	27.7	569	136	23.9	566	123	21.7	572	123	21.5	339	1938	2277	540	23.7
Johnson	98	23	23.5	98	13	13.3	98	25	25.5	98	19	19.4	52	340	392	80	20.4
Knox	105	25	23.8	105	20	19.0	104	19	18.3	104	17	16.3	98	320	418	81	19.4
Lee	45	6	13.3	44	13	29.5	44	5	11.4	44	9	20.5	17	160	177	33	18.6
Lowden-Miller	13	4	30.8	13	2	15.4	13	3	23.1	13	3	23.1	0	52	52	11	21.2
Macoupin	118	26	22.0	118	40	33.9	118	21	17.8	117	22	18.8	131	340	471	109	23.1
Marion	142	40	28.2	142	18	12.7	140	43	30.7	141	27	19.1	147	418	565	128	22.7
Marshall-Putnam	19	2	10.5	30	4	13.3	15	4	26.7	26	2	7.7	13	77	90	12	13.3
Mason	61	26	42.6	61	14	23.0	60	12	20.0	60	26	43.3	42	200	242	78	32.2
McDonough	61	20	32.8	80	15	18.8	79	17	21.5	80	18	22.5	80	220	300	70	23.3
Mercer	58	15	25.9	57	11	19.3	57	6	10.5	56	10	17.9	29	199	228	42	18.4
Monroe	76	16	21.1	133	13	9.8	84	22	26.2	89	17	19.1	71	311	382	68	17.8
Morgan	93	36	38.7	93	41	44.1	91	17	18.7	92	26	28.3	70	299	369	120	32.5
Ogle	79	11	13.9	85	4	4.7	78	9	11.5	83	10	12.0	19	306	325	34	10.5
Pike	390	74	19.0	387	96	24.8	388	81	20.9	389	71	18.3	473	1081	1554	322	20.7
Pope	391	67	17.1	391	29	7.4	390	37	9.4	390	41	10.5	162	1402	1564	174	11.1
Randolph	173	47	27.2	173	31	17.9	172	38	22.1	172	39	22.7	150	540	690	155	22.5
Rock Island	76	20	26.3	76	10	13.2	76	19	25.0	75	12	16.0	23	280	303	61	20.1
Saline	73	14	19.2	72	7	9.7	72	7	9.7	72	14	19.4	29	260	289	42	14.5
Schuyler	321	70	21.8	321	67	20.9	321	77	24.0	320	51	15.9	283	1000	1283	265	20.7
Scott	66	24	36.4	87	35	40.2	82	27	32.9	73	20	27.4	58	250	308	106	34.4
Site M	17	8	47.1	16	5	31.3	16	6	37.5	16	2	12.5	0	65	65	21	32.3
St. Clair	61	18	29.5	61	5	8.2	61	12	19.7	61	9	14.8	44	200	244	44	18.0
Stephenson	85	32	37.6	85	21	24.7	85	28	32.9	84	18	21.4	39	300	339	99	29.2
Tazewell	58	8	13.8	58	8	3.8	58	2	3.4	57	8	14.0	31	200	231	26	11.3
Union	269	56	20.8	267	23	8.6	269	27	10.0	242	25	10.3	69	978	1047	131	12.5
Washington	54	15	27.8	58	3	5.2	47	3	6.4	47	5	10.6	46	160	206	26	12.6
Whiteside	54	21	38.9	54	16	29.6	54	10	18.5	55	15	27.3	16	201	217	62	28.6
Williamson	73	14	19.2	71	3	4.2	69	8	11.6	56	9	16.1	9	260	269	34	12.6
Winnebago	54	9	16.7	54	9	16.7	54	11	20.4	53	12	22.6	15	200	215	41	19.1
TOTALS	6938	1674	24.1	7049	1344	19.1	6879	1284	18.7	6860	1217	17.7	5249	22477	27726	5519	19.9

Table 2. 1994 Spring Turkey Season - Cumulative Results

County	Permits Issued	Birds Harvested	Hunter Success	Percent Juvenile	Percent Forest	Forest Area (sq. mi.)	Hunter Density (Hunter/sq. mi.)	Harvest Density (Birds/sq. mi.)
Adams	1290	272	21.1	42.7%	19.9	173	7.5	1.58
Alexander	543	66	12.2	51.5%	45.9	103	5.3	0.64
Bond	236	41	17.4	56.0%	20.7	79	3.0	0.52
Brown	878	216	24.6	56.0%	33.8	104	8.5	2.08
Bureau	269	45	16.7	46.7%	7.4	65	4.2	0.70
Calhoun	909	270	29.7	44.8%	53.1	137	6.6	1.96
Carroll	912	197	21.6	35.5%	14.7	69	13.2	2.86
Cass	445	119	26.7	62.2%	18.7	69	6.4	1.72
Clark	176	17	9.7	76.5%	28.2	143	1.2	0.12
Clay	421	66	15.7	60.6%	22.3	103	4.1	0.64
Cumberland	240	35	14.6	51.4%	18.9	65	3.7	0.54
Effingham	426	53	12.4	54.7%	20.2	97	4.4	0.54
Fayette	358	39	10.9	53.9%	22.5	162	2.2	0.24
Fulton	556	77	13.8	62.3%	21.6	189	2.9	0.41
Gallatin-Hardin	932	115	12.3	61.7%	34.7	81	11.5	1.41
Greene	563	155	27.5	52.3%	18.6	101	5.6	1.53
Hancock	867	212	24.5	44.8%	12.6	101	8.6	2.11
Henderson	469	137	29.2	39.2%	22.1	84	5.6	1.63
Jackson	1154	164	14.2	55.5%	38.5	232	5.0	0.71
Jersey	970	208	21.4	42.3%	29.5	110	8.8	1.89
JoDavless	2277	540	23.7	28.3%	19.1	117	19.4	4.60
Johnson	392	80	20.4	67.5%	47.1	163	2.4	0.49
Knox	418	81	19.4	53.1%	13.5	98	4.3	0.83
Lee	177	33	18.6	12.1%	4.2	30	5.8	1.09
Lowden-Miller	52	11	21.2	36.4%	95.5	3	15.8	3.33
Macoupin	471	109	23.1	53.2%	21.2	185	2.5	0.59
Marion	565	128	22.7	46.8%	26.2	152	3.7	0.84
Marshall-Putnam	90	12	13.3	41.7%	13.8	78	1.2	0.15
Mason	242	78	32.2	21.8%	13.2	71	3.4	1.09
McDonough	300	70	23.3	60.0%	13.9	81	3.7	0.86
Mercer	228	42	18.4	33.3%	10.0	58	3.9	0.73
Monroe	382	68	17.8	41.2%	27.9	106	3.6	0.64
Morgan	369	120	32.5	31.7%	14.6	96	3.9	1.25
Ogle	325	34	10.5	35.3%	8.3	63	5.2	0.54
Pike	1554	322	20.7	36.7%	26.8	222	7.0	1.45
Pope	1564	174	11.1	56.9%	70.0	267	5.9	0.65
Randolph	690	155	22.5	51.6%	24.4	145	4.8	1.07
Rock Island	303	61	20.1	27.9%	19.0	80	3.8	0.77
Saline	289	42	14.5	64.3%	24.2	93	3.1	0.45
Schuyler	1283	265	20.7	54.0%	32.7	142	9.0	1.87
Scott	308	106	34.4	74.6%	19.6	49	6.3	2.16
Site M	65	21	32.3	38.1%	50.0	12	5.6	1.79
St. Clair	244	44	18.0	15.9%	17.7	118	2.1	0.37
Stephenson	339	99	29.2	38.4%	5.3	30	11.3	3.30
Tazewell	231	26	11.3	26.9%	8.7	57	4.0	0.46
Union	1047	131	12.5	57.3%	51.9	215	4.9	0.61
Washington	206	26	12.6	57.7%	17.4	98	2.1	0.27
Whiteside	217	62	28.6	35.5%	3.7	29	7.6	2.17
Williamson	269	34	12.6	67.7%	35.8	153	1.8	0.22
Winnebago	215	41	19.1	29.3%	5.2	27	8.0	1.53
TOTALS	27726	5519	19.9	45.9%		5304	5.2	1.04

Table 3A. Daily Turkey Harvest and Hunter Success
Northern Zone - 1994 Spring Season

DATE	NORTH ZONE HARVEST	HUNTER SUCCESS	% OF TOTAL HARVEST
April 11	312	6.7%	7.6%
April 12	200	4.6%	4.9%
April 13	221	5.4%	5.4%
April 14	304	7.8%	7.4%
April 15	135	3.8%	3.3%
1st Season	1172	25.3%	28.6%
April 16	358	7.6%	8.7%
April 17	318	7.3%	7.8%
April 18	137	3.4%	3.3%
April 19	122	3.1%	3.0%
April 20	99	2.6%	2.4%
April 21	62	1.7%	1.5%
2nd Season	1096	23.2%	26.8%
April 22	205	4.5%	5.0%
April 23	214	4.9%	5.2%
April 24	194	4.7%	4.7%
April 25	98	2.5%	2.4%
April 26	57	1.5%	1.4%
April 27	63	1.7%	1.5%
April 28	17	0.5%	0.4%
April 29	85	2.3%	2.1%
3rd Season	933	20.4%	22.8%
April 30	94	2.0%	2.3%
May 1	144	3.2%	3.5%
May 2	79	1.8%	1.9%
May 3	49	1.1%	1.2%
May 4	66	1.6%	1.6%
May 5	65	1.6%	1.6%
May 6	58	1.4%	1.4%
May 7	63	1.6%	1.5%
May 8	110	2.8%	2.7%
May 9	43	1.1%	1.1%
May 10	50	1.3%	1.2%
May 11	71	1.9%	1.7%
4th Season	892	19.4%	21.8%
Grand Total	4093	22.1%	100.0%

Table 3B. Daily Turkey Harvest and Hunter Success
Southern Zone - 1994 Spring Season.

DATE		SOUTH ZONE HARVEST	HUNTER SUCCESS	% OF TOTAL HARVEST
April	4	216	9.6%	15.1%
April	5	100	4.9%	7.0%
April	6	32	1.6%	2.2%
April	7	77	4.0%	5.4%
April	8	77	4.2%	5.4%
1st Season		502	22.2%	35.2%
April	9	91	4.0%	6.4%
April	10	30	1.4%	2.1%
April	11	28	1.3%	2.0%
April	12	20	0.9%	1.4%
April	13	33	1.6%	2.3%
April	14	46	2.2%	3.2%
2nd Season		248	10.9%	17.4%
April	15	30	1.3%	2.1%
April	16	72	3.2%	5.0%
April	17	83	3.9%	5.8%
April	18	35	1.7%	2.5%
April	19	44	2.2%	3.1%
April	20	32	1.6%	2.2%
April	21	24	1.2%	1.7%
April	22	31	1.6%	2.2%
3rd Season		351	15.6%	24.6%
April	23	61	2.8%	4.3%
April	24	50	2.3%	3.5%
April	25	21	1.0%	1.5%
April	26	19	0.9%	1.3%
April	27	10	0.5%	0.7%
April	28	22	1.1%	1.5%
April	29	21	1.0%	1.5%
April	30	14	0.7%	1.0%
May	1	34	1.7%	2.4%
May	2	18	0.9%	1.3%
May	3	21	1.1%	1.5%
May	4	34	1.8%	2.4%
4th Season		325	14.7%	22.8%
Grand Total		1426	15.8%	100.0%

Table 4. Successful turkey hunter statistics, 1994 Spring Season.

	Hunter Success	Average Number Birds/Day		Average # Years Turkey Hunting Experience	Average # Hunted in
		Heard	Seen		
Adams	21.1	1.9	2.3	5.3	3.1
Alexander	12.2	1.0	1.1	12.3	3.3
Bond	17.4	2.6	4.3	5.7	2.9
Brown	24.6	2.2	2.4	7.3	2.8
Bureau	16.7	1.9	2.0	2.1	2.2
Calhoun	29.7	1.0	1.1	7.2	3.3
Carroll	21.6	4.6	3.3	4.1	2.4
Cass	26.7	2.4	2.7	5.1	2.7
Clark	9.7	0.6	1.0	8.2	2.5
Clay	15.7	0.9	1.0	7.7	3.9
Cumberland	14.6	2.0	2.3	5.4	2.8
Effingham	12.4	1.8	2.7	6.9	3.2
Fayette	10.9	1.7	2.7	6.8	3.6
Fulton	13.8	1.8	1.5	6.4	3.2
Gallatin-Hardin	12.3	1.8	1.6	8.3	3.1
Greene	27.5	1.9	1.5	5.5	2.8
Hancock	24.5	2.7	2.5	4.5	2.7
Henderson	29.2	3.2	2.5	4.1	3.9
Jackson	14.2	1.6	1.6	8.2	3.0
Jersey	21.4	2.1	1.6	6.8	3.3
JoDavie	23.7	5.2	4.9	4.9	2.5
Johnson	20.4	2.1	1.7	7.7	2.4
Knox	19.4	3.4	2.7	3.4	2.7
Lee	18.6	1.7	2.0	2.6	2.5
Lowden-Miller	21.2	1.5	1.1	5.8	3.1
Macoupin	23.1	2.3	2.1	5.3	2.8
Marion	22.7	1.5	1.5	6.3	3.1
Marshall/Putnam	13.3	2.0	2.6	4.5	1.8
Mason	32.2	3.6	4.3	2.2	2.6
McDonough	23.3	2.6	2.9	5.6	3.2
Mercer	18.4	1.9	1.8	4.6	3.6
Monroe	17.8	1.4	1.7	6.8	3.0
Morgan	32.5	3.4	3.3	4.7	2.8
Ogle	10.5	2.8	2.2	4.8	2.6
Pike	20.7	1.1	1.1	6.8	3.4
Pope	11.1	2.0	1.6	8.5	2.8
Randolph	22.5	2.0	1.9	5.4	2.8
Rock Island	20.1	1.6	1.6	5.4	3.2
Saline	14.5	1.7	1.6	9.3	2.7
Schuyler	20.7	2.4	2.4	6.4	3.1
Scott	34.4	1.7	1.5	4.4	5.0
Site M	32.3	4.4	4.3	5.7	2.4
St. Clair	18.0	1.9	1.9	6.1	2.8
Stephenson	29.2	3.6	3.2	3.6	2.4
Tazewell	11.3	3.0	2.5	1.6	1.9
Union	12.5	1.7	1.4	10.9	3.0
Washington	12.6	1.4	1.3	5.2	2.4
Whiteside	28.6	2.3	3.6	3.1	2.5
Williamson	12.6	1.7	1.8	7.3	2.7
Winnebago	19.1	1.6	1.4	4.6	2.9
Statewide	19.9	2.3	2.2	6.0	3.0

Table 5. Physical data on harvested turkeys, 1994 Spring Season.

	Average Weight		Largest (lbs.)	Longest	
	Adult	Juvenile		Beard (in.)	Spur (in.)
Adams	21.1	15.2	25.5	12.3	1.8
Alexander	20.2	14.7	24.0	11.3	1.4
Bond	21.2	16.3	24.5	11.0	1.2
Brown	21.2	16.0	27.0	12.3	1.5
Bureau	23.2	16.2	26.5	10.3	1.5
Calhoun	20.6	14.9	27.5	11.5	1.8
Carroll	20.9	14.7	25.8	12.0	1.5
Cass	20.3	15.0	25.0	11.0	1.5
Clark	20.5	15.6	22.0	11.5	1.3
Clay	20.2	14.8	24.1	11.0	1.5
Cumberland	22.7	15.6	26.0	11.0	1.3
Effingham	20.1	14.0	24.0	11.3	1.5
Fayette	21.0	15.9	28.5	10.5	1.4
Fulton	21.1	16.2	26.0	11.0	1.4
Gallatin-Hardin	19.8	14.8	28.0	11.0	2.3
Greene	20.8	15.3	25.7	11.3	1.3
Hancock	20.9	15.2	25.0	11.8	2.0
Henderson	21.6	15.1	30.0	12.0	1.5
Jackson	20.5	14.8	24.5	11.5	1.3
Jersey	20.6	14.4	24.5	15.0	1.8
JoDaviss	21.1	14.7	28.0	12.0	1.6
Johnson	20.0	15.7	25.0	12.3	1.1
Knox	21.4	15.2	24.5	11.0	1.6
Lee	21.7	15.6	25.5	12.0	1.5
Lowden-Miller	19.4	14.0	23.0	10.9	1.1
Macoupin	21.6	16.0	34.5	11.5	1.4
Marion	19.8	14.8	25.0	11.8	1.3
Marshall/Putnam	22.0	16.1	24.5	11.8	1.5
Mason	21.2	15.3	24.8	12.9	1.6
McDonough	21.0	15.6	25.0	11.5	1.4
Mercer	22.5	15.6	28.0	11.5	1.5
Monroe	21.0	16.4	26.0	11.5	1.4
Morgan	22.6	16.4	30.0	13.0	1.9
Ogle	21.0	15.3	23.5	12.4	1.4
Pike	20.9	15.1	26.5	12.0	1.8
Pope	19.7	14.6	24.0	12.3	1.5
Randolph	20.9	16.3	29.5	12.3	1.8
Rock Island	21.1	14.8	25.5	12.0	1.5
Saline	19.6	14.8	22.0	11.0	1.1
Schuyler	20.7	15.5	25.3	11.4	1.9
Scott	22.4	16.8	28.0	11.0	1.6
Site M	21.6	14.9	24.5	12.0	1.3
St. Clair	20.0	16.1	25.0	11.0	1.5
Stephenson	21.5	14.6	27.3	11.0	1.5
Tazewell	22.4	15.1	29.0	10.8	1.4
Union	20.1	15.7	24.0	11.8	1.3
Washington	20.6	15.9	25.0	11.1	1.2
Whiteside	20.6	14.0	24.0	11.8	1.4
Williamson	20.6	15.5	24.5	11.0	1.3
Winnebago	21.3	15.9	26.0	11.8	2.0
Statewide	20.9	15.3	34.5	15.0	2.3

Table 6. Wild Turkey Harvest in Illinois, 1970-1994 Spring Seasons

COUNTY	(YEAR) 1970-80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	Total
Adams		20	20	20	20	30	45	54	80	119	149	187	185	259	272	1460
Alexander	221	41	43	45	48	55	67	70	81	97	78	81	85	73	66	1151
Bond														44	41	85
Brown		25	20	27	28	44	85	103	106	126	128	158	121	167	216	1354
Bureau														40	45	85
Calhoun	47	33	34	34	44	52	85	86	111	136	139	183	181	192	270	1627
Carroll									60	86	96	152	179	211	197	981
Cass											51	51	85	87	119	393
Clark														26	17	43
Clay												48	35	68	66	217
Cumberland														40	35	75
Efvingham											42	29	54	58	53	236
Fayette										45	41	31	38	40	39	234
Fulton								32	38	43	53	57	59	72	77	431
Gallatin-Hardin					50	69	83	96	119	79	86	140	117	114	115	1068
Greene								39	56	68	91	101	115	129	155	754
Hancock										77	96	90	134	231	212	840
Henderson											52	68	83	113	137	453
Jackson	129	44	51	56	71	99	98	91	144	106	149	161	130	142	164	1635
Jersey					27	50	81	94	116	129	119	195	192	192	208	1403
JoDaviess					35	59	68	96	176	240	313	356	457	556	540	2896
Johnson								26	23	27	26	30	46	42	80	300
Knox													49	62	81	192
Lee															33	33
Lowden-Miller SF															11	11
Macoupin								39	26	32	38	56	76	72	109	448
Marion											67	88	87	91	128	461
Marshall-Putnam		27	16	23	9	11	13	16	10	12	17	20	14	7	12	207
Mason															78	78
McDonough								39	37	35	45	37	58	62	70	383
Mercer														46	42	88
Monroe										62	62	38	67	56	68	353
Morgan															120	120
Ogle												44	43	42	34	163
Pike				32	49	68	111	145	178	230	249	283	266	289	322	2222
Pope	61	37	50	44	58	69	110	100	162	123	143	182	185	145	174	1643
Randolph									44	57	88	80	121	100	155	645
Rock Island													47	58	61	166
Saline					10	22	31	37	37	46	31	42	42	32	42	372
Schuyler						85	108	138	175	229	238	270	222	269	265	1999
Scott													75	83	106	264
Site M															21	21
St. Clair															44	44
Stephenson														62	99	161
Tazewell															26	26
Union	280	85	68	63	70	109	98	88	163	128	142	130	153	123	131	1831
Washington										25	23	30	24	25	26	153
Whiteside														51	62	113
Williamson															18	34
Winnebago			11	10	11	18	29	21	28	24	28	28	33	43	41	84
TOTALS	738	312	313	354	530	840	1112	1410	1970	2381	2880	3446	3858	4632	5519	30295

TABLE 7. WILD TURKEY HARVEST IN ILLINOIS, 1993 FALL ARCHERY SEASON

COUNTY	KILL
<hr/>	
Adams	3
Alexander	1
Bond	1
Brown	3
Calhoun	3
Carroll	7
Cass	4
Clark	1
Clay	2
Effingham	2
Fayette	3
Greene	1
Hancock	3
Henderson	3
Jackson	2
Jersey	2
JoDaviess	14
Johnson	1
Knox	1
Macoupin	3
Marion	4
Marshall	1
McDonough	1
Ogle	1
Pike	6
Pope	2
Randolph	2
Scott	2
Stephenson	3
Union	1
Washington	1
Whiteside	1
Williamson	1
Unknown	2
<hr/>	
TOTAL	88

TABLE 8. 1993 FALL FIREARM TURKEY SEASON RESULTS

COUNTY	PERMITS ISSUED	KILL	SUCCESS	AM	# OF BIRDS TAKEN JM	AF	JF
Adams	225	26	11.6%	7	8	6	5
Alexander	64	10	15.6%	2	3	2	3
Brown	168	28	16.7%	3	10	10	5
Calhoun	165	28	17.0%	1	13	10	4
Carroll	217	39	18.0%	7	16	7	9
Gallatin-Hardin	194	40	20.6%	1	17	1	21
Greene	98	21	21.4%	3	8	7	3
Hancock	115	18	15.7%	3	6	6	3
Jackson	199	32	16.1%	0	12	6	14
Jersey	156	23	14.7%	3	7	8	5
JoDavieess	558	181	32.4%	36	57	42	46
Pike	296	53	17.9%	12	16	13	12
Pope	293	36	12.3%	4	10	11	11
Randolph	73	15	20.5%	2	5	4	4
Saline	45	5	11.1%	1	2	2	0
Schuyler	352	94	26.7%	9	36	23	26
Union	111	26	23.4%	4	9	10	3
Williamson	45	9	20.0%	1	2	4	2
TOTALS	3,374	684	20.3%	99 (14.5%)	237 (34.6%)	172 (25.1%)	176 (25.7%)

AM = Adult Male; JM = Juvenile Male; AF = Adult Female; JF = Juvenile Female

TABLE 9. DAILY TURKEY HARVEST AND HUNTER SUCCESS, 1993 FALL
FIREARM SEASON

DATE	STATEWIDE KILL	HUNTER SUCCESS	% OF TOTAL KILL
October 16	176	5.2%	25.7%
October 17	115	3.6%	16.8%
October 18	65	2.1%	9.5%
October 19	49	1.6%	7.2%
October 20	31	1.0%	4.5%
October 21	56	1.9%	8.2%
October 22	41	1.4%	6.0%
October 23	88	3.1%	12.9%
October 24	63	2.3%	9.2%
TOTALS	684	20.3%	100.0%

FIGURE 1. ILLINOIS TURKEY HUNTING

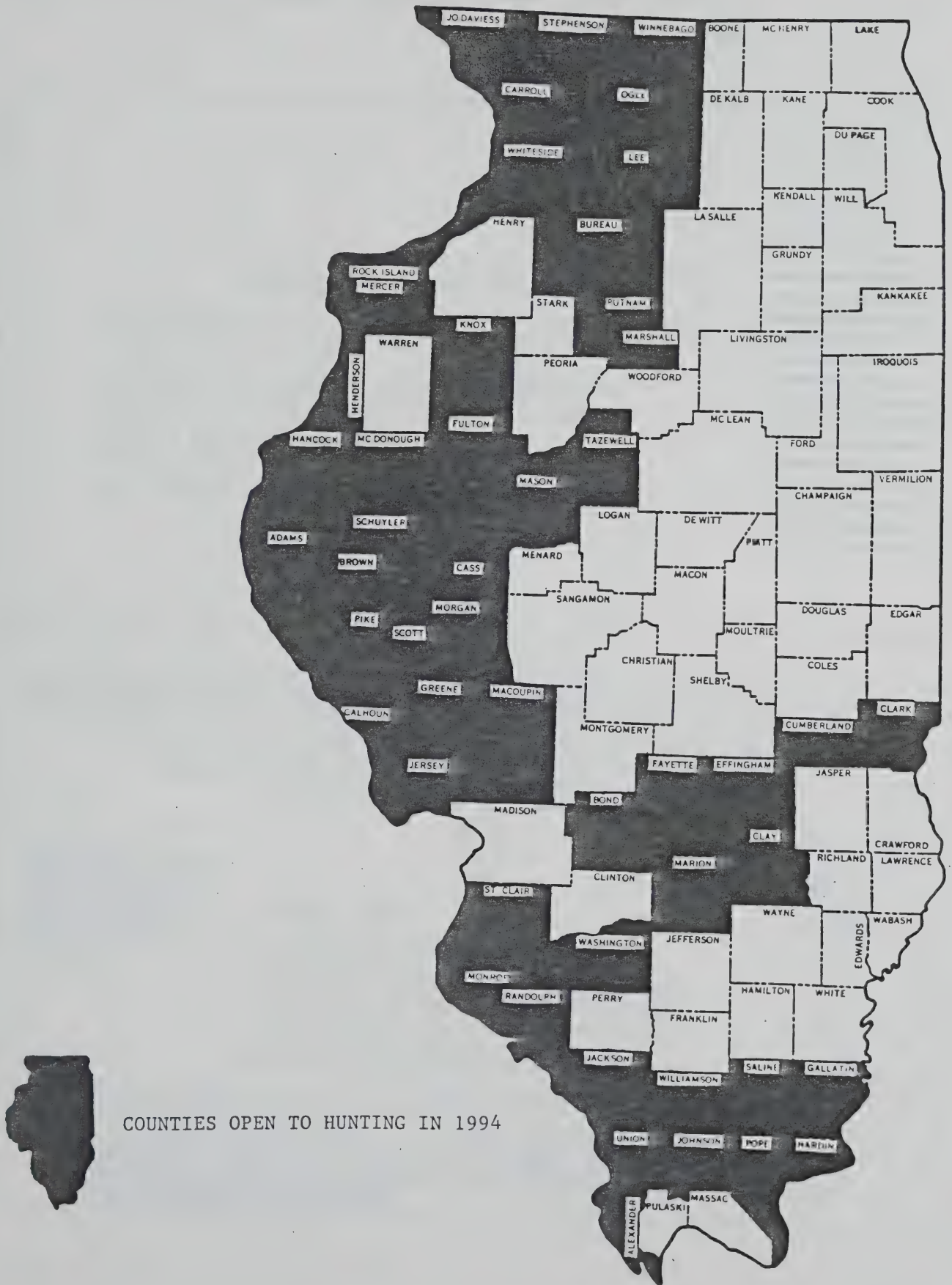
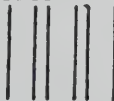


FIGURE 2. MAIL-IN ENVELOPE FOR FALL ARCHERY TURKEY HUNTERS

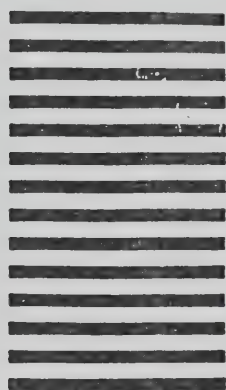


BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 2032 JONESBORO, ILLINOIS

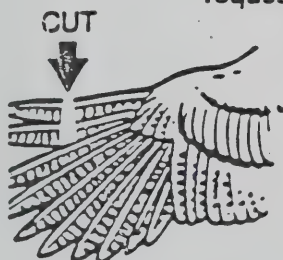
POSTAGE WILL BE PAID BY

**ILLINOIS DEPARTMENT OF CONSERVATION
FISH & WILDLIFE RESOURCES — TURKEY
UNION COUNTY REFUGE
R.R. 2, BOX 181A
JONESBORO, IL 62952**

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES



ILLINOIS STATE LAW REQUIRES THAT YOU RECORD YOUR TURKEY WITHIN 48 HOURS AFTER HARVEST. Your obligation will be met by mailing in the outer $\frac{1}{3}$ of the last two primary wing feathers and a square breast feather along with the "mail-in-tag" section of your archery permit. You must also fill in the requested information below. Your cooperation will be valuable in the management of our turkey population.



REMOVE BREAST
FEATHERS
HERE



DIRECTIONS

1. With scissors, clip off the outer $\frac{1}{3}$ of the last two primary wing feathers (the most forward two, major wing feathers).
2. If you intend to have your turkey mounted, please indicate the sex and weight in lieu of mailing in the feathers.
3. Complete the requested information below:

County where taken _____; Number of trips bowhunting 1-5 ☐, 6-10 ☐, 11-15 ☐, over 15 ☐; SEX OF TURKEY M ☐ F ☐; IF MALE, Length of Beard _____ inches; Length of Spur _____ inches (or mail in one spur by cutting through the leg on each side of it). IF YOU WISH TO RECEIVE A PIN TO INDICATE A SUCCESSFUL TURKEY HUNT, PLEASE ENCLOSE A STAMPED, SELF-ADDRESSED ENVELOPE.

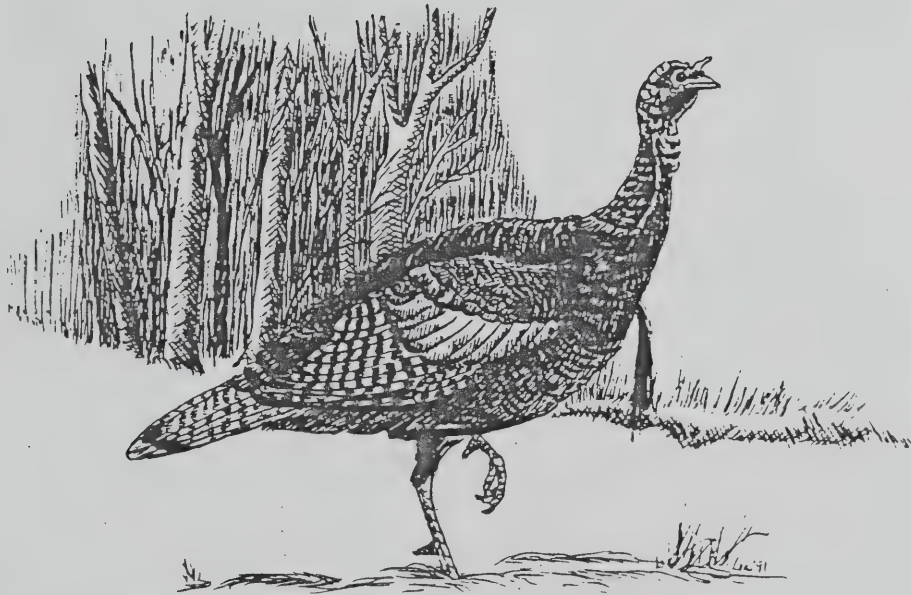
FINAL REPORT
SURVEYS AND INVESTIGATIONS PROJECTS
As Required By
FEDERAL AID IN WILDLIFE RESTORATION ACT
ILLINOIS

Federal Aid Project W-105-R(5)

STUDY III: RESTOCKING OF WILD TURKEYS
Job III A. Wild Turkey Habitat Evaluation
Job III B. Restocking of Wild Turkeys

By

Jared K. Garver
Forest Wildlife Biologist



Brent Manning, Director

Jeffrey M. Ver Steeg, Supervisor, Division of Wildlife Resources

John Buhnerkempe, Section Head, Forest and Grassland Section

ILLINOIS DEPARTMENT OF CONSERVATION

Mike Sweet
P-R Coordinator

Paul Shelton, Supervisor
Forest Wildlife Program

July 18, 1994

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FINAL REPORT
SURVEYS AND INVESTIGATIONS PROJECTS

STATE OF ILLINOIS

PROJECT NO: W-105-R(5)

STUDY III: RESTOCKING OF WILD TURKEYS

Job III A: Wild turkey habitat evaluation

Job III B: Restocking of wild turkeys

ABSTRACT: The Priority List for Wild Turkey Release Sites for FY'94 includes 31 release sites in 27 counties of the state. Stockings were completed at 16 of these sites. Additional stockings were completed in Edwards, and Adams counties. Eight birds were shipped to Minnesota and 83 birds were traded to Kentucky for 50 river otters.

Trapping efforts during FY'94 resulted in the transplanting of 127 gobblers and 256 hens.

FINAL REPORT

SURVEYS AND INVESTIGATIONS PROJECTS

STATE OF ILLINOIS

PROJECT NO: W-105-R(5)

STUDY III: RESTOCKING OF WILD TURKEYS

Objective: To re-establish wild turkeys in as many areas of suitable habitat as possible throughout the state.

Job III A: Wild turkey habitat evaluation

Job III B: Restocking of wild turkeys

Objective: To identify and prioritize potential release sites for wild turkeys; to trap and transplant annually as many turkeys as possible to these areas.

Procedures: Maps and aerial photos showing the forested areas of Illinois were carefully analyzed to determine the location of the largest and most extensive tracts of forest in the state. District Wildlife Managers were contacted to gain additional information on each potential site. Aerial surveys were conducted in 1980, 1981 and 1989 to help determine the extent of the potential habitat and the best central location for a release site within a given area. Some of these areas were then assessed by looking at them on the ground.

Using the above collected information, a Turkey Stocking Priority List was developed. This list (Table 1) is updated annually as some areas are stocked and others are evaluated by District Wildlife Managers.

Prior to stocking a new area, we require that a group of at least 10 to 15 interested landowners, around the proposed release site, sign a Turkey Stocking Petition (Figure 1). This petition states that the landowner is interested in having wild turkeys stocked and that he will agree to help protect the birds to insure their success. Signatures for these petitions are obtained by District Wildlife Managers, sportsmen's groups or extremely interested individuals. Just prior to or after stocking wild turkeys in a new area, a news release (Figure 2), announcing the stocking, is sent to local newspapers. The main purpose of this news release is to try to get the general public's support and cooperation in re-

establishing wild turkeys in their area.

Most of the trapping effort was carried out by District Wildlife Managers and 1 Conservation Police Officer. The National Wild Turkey Federation provided funds to hire 2 people to assist in northern Illinois trapping efforts, and 1 person to help in southern Illinois. These people were responsible for establishing and maintaining bait sites in Ogle, Jersey, Pike, Fulton, Carroll, McDonough, Alexander, Henderson, Randolph, Schuyler, Hardin, Monroe, JoDaviess, Brown, Jackson, Gallatin, Union, Williamson, Cass, Winnebago, Massac, Madison, and Pope counties. Our trapping efforts started in late December and ended in mid-March.

Bait sites were established in likely locations by using shelled or cracked corn. Bait trails, leading from the actual bait site, were extended for up to 1/4 mile away to increase our chances of attracting turkeys. These bait sites and trails were checked every 2 to 4 days and re-baited if necessary. Once turkeys started using a bait site, then it was usually checked daily to insure the availability of corn. Actual trapping attempts occurred as soon as possible after noting regular usage by turkeys.

Trapping equipment consisted of a 40' x 60' or 33' x 57', 2" mesh, knotless nylon nets, propelled by 3 recoilless rockets. Some trappers utilized boxes with 40' x 40' diamond shaped nets. Ignition to the rocket charges was provided by a 12-volt lantern battery or Mod. 10 Handi-Blaster through 18/2 jacketed thermostat wire. Prior to each trapping session, the battery voltage and circuitry was checked using a 1-volt Multitester or Galvanometer. For trapping we utilized custom built canvas or nylon blinds (Figure 3). In some cases, Honda 3-wheel and 4-wheel ATV's were used as transportation to haul bait, equipment and personnel to bait sites and to transport trapped birds from sites to waiting vehicles.

Captured birds were transported in specially treated cardboard boxes donated by the National Wild Turkey Federation and released as soon as possible at a new site.

If at all possible, we try to stock 12 to 15 total birds, consisting of 4 adult gobblers and 8 to 10 hens, at a new release site. We feel that these are minimal numbers needed to insure success. We

did have a successful stocking with 2 juvenile gobblers and 7 hens in Williamson County (Table 2) in 1978.

Results:

The Priority List of Wild Turkey Release Sites for FY'93 was updated and revised. FY'94 included 31 release sites in 27 counties of the state (Table 1).

Trapping success during FY'94 was slightly better than in FY'93. We transplanted a total of 127 gobblers and 256 hens as compared to 114 gobblers and 222 hens in FY'93 (Table 3) which was an average year.

Stockings were completed at 16 new sites. A release site in Edwards County that was started in 1992 was also completed this year. In addition, 8 birds were shipped to Minnesota and 83 birds were traded to Kentucky for 50 river otters.

Recommendations:

We should continue to evaluate potential release sites and revise our priority listing annually.

Data and Reports:

Original data and related reports in this investigation are on file in the Division of Wildlife Resources office of the Illinois Department of Conservation, Union County Refuge, Jonesboro, Illinois 62952.

TABLE 1. PRIORITY LIST OF WILD TURKEY RELEASE SITES - FY'94

<u>COUNTY</u>	<u>LOCATION</u>
1. JACKSON	T. 7S.-R. 1W., SEC. 10
2. CHRISTIAN	T.14N.-R. 3W., SEC. 18
3. CRAWFORD	T. 7N.-R.13W., SEC. 11
4. MOULTRIE	T.14N.-R. 4E., SEC. 36
5. HENRY	T.14N.-R. 3E., SEC. 18
6. WILLIAMSON	T. 8S.-R. 1E., SEC. 9
7. WILLIAMSON	T. 8S.-R. 4E., SEC. 22
8. MASON	T.20N.-R. 7W., SEC. 25
9. EDGAR	T.15N.-R.11W., SEC. 36
10. VERMILION	T.19N.-R.12W., SEC. 19
11. LASALLE	T.35N.-R. 5E., SEC. 32
12. WOODFORD	T.25N.-R. 1E., SEC. 3
13. STARK	T.14N.-R. 7E., SEC. 29
14. WILL	T.34N.-R. 9E., JOLIET ARS.
15. KENDALL	T.37N.-R. 6E., SEC. 33
16. KANE	T.38N.-R. 6E., SEC. 26
17. MCHENRY	T.44N.-R. 5E., SEC. 28
18. PULASKI	T.16S.-R. 1W., SEC. 9
19. KANKAKEE	T.30N.-R.11W., SEC. 33
20. WASHINGTON	T. 3S.-R. 2W., SEC. 5
21. JEFFERSON	T. 4S.-R. 1E., SEC. 19
22. COOK	T.42N.-R.11E., SEC. 29
23. COOK	T.37N.-R.12E., SEC. 18
24. UNION	T.13S.-R. 1E., SEC. 7
25. UNION	T.11S.-R. 1E., SEC. 30
26. SHELBY	T.10N.-R. 2E., SEC. 31
27. MACON	T.16N.-R. 1E., SEC. 22
28. DOUGLAS	T.15N.-R. 7E., SEC. 27
29. DEWITT	T.21N.-R. 2E., SEC. 20
30. IROQUOIS	T.26N.-R.14W., SEC. 11,12
31. IROQUOIS	T.27N.-R.11W., SEC. 20

* The sequence of releases will not necessarily be in the exact same order as listed. Various factors such as weather and the trapping locations will determine the actual order of releases. However, every effort will be made to follow the above priorities as much as possible.

TABLE 2. SUMMARY OF WILD TRAPPED TURKEY RELEASES IN ILLINOIS, 1959-1992

YEAR	NUMBER		TRAP SITE	RELEASE SITE
	HENS	GOBBLERS		
1959	0	7	Mississippi	Jackson Co.
1959	6	2	West Virginia	Pope Co.
1960	10	2	Ark. & Miss.	Jackson Co.
1960	8	4	West Virginia	Alexander Co.
1961	7	2	Arkansas	South Pope Co.
1961	?	?	Miss. & W. Virginia	Union Co.
1964	5	2	Arkansas	Alexander Co.
1967	6	4	W. Virginia	Pope Co.
1970	2	2	Union Co.	Saline Co.
1971	0	3	Alexander Co.	Pope Co.
1972	2	0	Alexander Co.	Pope Co.
1973	6	1	Alexander Co.	Pope Co.
1974	13	2	Union Co.	Calhoun Co.
1975	0	4	Alexander Co.	Adams Co.
1975	0	2	Alexander Co.	Pope Co.
1976	7	3	Alexander Co.	Adams Co.
1976	9	5	Alexander Co.	Pope Co.
1977	12	0	Union Co.	Hardin Co.
1978	7	2	Jackson Co.	Williamson Co.
1978	9	6	Union Co.	Randolph Co.
1979	11	3	Missouri	Jersey Co.
1979	5	0	Union Co.	Brown Co.
1979	0	3	Missouri	Brown Co.
1979	5	1	Union Co.	Hardin Co.
1980	11	2	Union Co.	Pike Co.
1980	10	5	Alexander Co.	Pike Co.
1980	8	5	Alexander Co.	JoDaviess Co.
1980	3	2	Missouri	Hardin Co.
1980	1	1	Adams Co.	Pike Co.
1980	10	3	Union Co.	Johnson Co.
1981	8	7	Union Co.	Johnson Co.
1981	8	4	Jackson Co.	Jackson Co.
1981	17	10	Union & Adams Co.	Schuyler Co.
1981	8	5	Union & Adams Co.	McDonough
1981	5	10	Union Co.	Pope (South)
1982	18	20	Marshall Co.	Woodford Co.
1982	13	1	Union & Adams Co.	Fulton Co.
1982	8	4	Jackson Co.	Macoupin Co.
1982	8	4	Jackson Co.	Clark Co.
1982	2	4	Jackson & Union Co.	Monroe Co.
1983	8	4	Brown & Alexander Co.	McDonough Co.
1983	9	2	Union Co.	Monroe Co.
1983	10	4	Union & Alexander Co.	Perry Co.
1983	0	2	Adams Co.	Fulton Co.
1984	8	4	Pope & Jackson Co.	Fayette Co.
1984	8	5	Pope & Jackson Co.	Fayette Co.

TABLE 2. SUMMARY OF WILD TRAPPED TURKEY RELEASES IN ILLINOIS, 1959-1992
(CONTINUED)

YEAR	NUMBER		TRAP SITE	RELEASE SITE
	HENS	GOBBLERS		
1984	7	6	Jackson & Brown Co.	Washington Co.
1984	8	5	Union & Brown Co.	Marion Co.
1985	11	7	Pope, JoDaviess Co., & Mo.	Marion Co.
1985	12	4	JoDaviess, Pope Co., & Mo.	Clay Co.
1985	8	4	JoDaviess Co.	Carroll Co.
1985	7	6	JoDaviess Co.	Carroll Co.
1985	14	4	Jackson Co. & Missouri	Greene Co.
1985	14	4	Jackson, Pope, Union Co. & Mo.	Effingham Co.
1985	10	4	Brown & Union Co.	Cass Co.
1985	9	3	Brown, Jackson, & Union Co.	Hancock Co.
1985	10	2	Union Co.	Johnson Co.
1985	2	0	Union Co.	Fayette Co.
1986	15	4	New Jersey	Bond Co.
1986	0	1	New Jersey	Cumberland Co.
1986	12	1	Hardin & Pope Co.	Cumberland Co.
1986	14	12	JoDaviess Co.	Henderson Co.
1986	4	0	Missouri	Hamilton Co.
1986	7	1	Hardin & Pope Co.	Hamilton Co.
1986	9	4	JoDaviess & Brown Co.	Ogle Co.
1987	4	5	Union, Hardin Co., & Missouri	Union Co.
1987	16	6	Union, Hardin, & JoDaviess Co.	Indiana
1987	1	2	JoDaviess	Henderson Co.
1987	10	5	JoDaviess	Rock Island Co.
1987	10	4	Union & Hardin Co.	Shelby Co.
1988	9	6	JoDaviess Co.	Peoria Co.
1988	10	6	JoDaviess Co.	Fulton Co.
1988	12	3	McDonough, JoDaviess & Fulton Co.	Fulton Co.
1988	10	7	JoDaviess Co.	Knox Co.
1988	13	5	JoDaviess & Jersey Co.	Indiana
1988	10	6	Jersey & Schuyler Co.	Montgomery Co.
1988	12	7	Jersey & JoDaviess Co.	Coles Co.
1988	5	0	JoDaviess Co.	Henderson Co.
1988	12	4	JoDaviess, Hardin, Jackson Co.	Crawford Co.
1988	12	5	Fulton & McDonough Co.	Tazewell Co.
1988	9	6	Schuyler, Fulton, JoDaviess Co.	Clinton Co.
1988	9	3	Ogle & JoDaviess Co.	Ogle Co.
1988	9	4	Ogle & JoDaviess Co.	Ogle Co.
1988	10	3	JoDaviess & Pope Co.	Vermilion Co.
1988	10	6	Jackson, Jersey, Randolph Co.	Richland Co.
1988	9	9	Pike & Randolph Co.	Randolph Co.
1988	14	5	Pike & Randolph Co.	St. Clair Co.
1988	2	0	Randolph Co.	Union Co.
1988	10	3	Pope & Calhoun Co.	Clay Co.
1988	6	4	Pike & Union Co.	Franklin Co.
1988	0	3	Schuyler Co.	Scott Co.
1988	0	3	Schuyler Co.	Hancock Co.

TABLE 2. SUMMARY OF WILD TRAPPED TURKEY RELEASES IN ILLINOIS, 1959-1992
(CONTINUED)

YEAR	NUMBER		TRAP SITE	RELEASE SITE
	HENS	GOBBLERS		
1989	8	7	JoDaviess Co.	Mercer Co.
1989	9	5	JoDaviess Co.	Mercer Co.
1989	10	4	Carroll, JoDaviess Co.	Lee Co.
1989	9	5	JoDaviess Co.	Rock Island Co.
1989	10	5	JoDaviess Co.	Whiteside Co.
1989	10	3	JoDaviess & Carroll Co.	Winnebago Co.
1989	11	4	Pope & Gallatin Co.	Massac Co.
1989	14	6	Jersey & Brown Co.	Madison Co.
1989	12	6	Jersey & Brown Co.	Macoupin Co.
1989	10	5	JoDaviess & Schuyler Co.	Bureau Co.
1989	10	4	JoDaviess & Schuyler Co.	Bureau Co.
1989	10	5	Fulton, Williamson, Carroll Co.	Clark Co.
1989	10	4	Fulton, Williamson, Carroll Co.	Cumberland Co.
1989	10	7	JoDaviess, Brown, Jackson Co.	Clinton Co.
1989	10	5	Carroll, JoDaviess Co.	Knox Co.
1989	12	4	Iowa	Scott Co.
1989	10	5	JoDaviess, Brown Co.	Sangamon Co.
1989	10	5	Carroll, Gallatin JoDaviess Co.	Wayne Co.
1989	9	6	Carroll, Gallatin, Union Co.	Wayne Co.
1989	10	4	JoDaviess & Hardin Co.	White Co.
1989	10	4	Brown & Ogle Co.	Fayette Co.
1989	9	3	Pope & Jackson Co.	Gallatin Co.
1990	9	6	JoDaviess Co.	Stephenson Co.
1990	10	4	JoDaviess Co.	Minnesota
1990	10	7	Pope & Williamson Co.	Johnson Co.
1990	12	6	Alexander, Pope, Williamson Co.	Pulaski Co.
1990	12	5	JoDaviess Co.	Mason Co.
1990	11	6	JoDaviess Co.	Lee Co.
1990	10	5	Pope & Williamson Co.	Massac Co.
1990	12	4	Pike, JoDaviess, Jersey Co.	Morgan Co.
1990	12	3	JoDaviess, Jersey, Pike Co.	Morgan Co.
1990	10	7	Jersey & Alexander Co.	Jefferson Co.
1990	10	5	Alexander, Union, Pope Co.	St. Clair Co.
1990	14	4	JoDaviess & Pike Co.	Coles Co.
1990	9	3	Union & Pope Co.	Clay Co.
1990	10	4	Union, JoDaviess, Pike, Pope Co.	Shelby Co.
1990	10	3	Pope & Ogle Co.	Fayette Co.
1990	5	6	JoDaviess Co.	Grundy Co.
1991	8	5	JoDaviess Co.	Grundy Co.
1991	12	5	JoDaviess Co.	LaSalle Co.
1991	12	8	JoDaviess & Ogle Co.	Putnam Co.
1991	11	8	JoDaviess & Ogle Co.	Henry Co.
1991	12	5	JoDaviess Co.	Marshall Co.
1991	11	5	JoDaviess Co.	Marshall Co.
1991	12	7	JoDaviess Co.	Will Co.
1991	8	7	JoDaviess & Brown Co.	Menard Co.
1991	12	6	JoDaviess & Brown Co.	Mason Co.

TABLE 2. SUMMARY OF WILD TRAPPED TURKEY RELEASES IN ILLINOIS, 1959-1992
(CONTINUED)

YEAR	NUMBER		TRAP SITE	RELEASE SITE
	HENS	GOBBLERS		
1991	8	6	JoDaviess & Brown Co.	Christian Co.
1991	10	7	Fulton & Henderson Co.	Warren Co.
1991	11	5	JoDaviess & Henderson Co.	DeWitt Co.
1991	6	5	JoDaviess & Henderson Co.	DeWitt Co.
1991	11	4	Schuyler & Jersey Co.	Edwards Co.
1991	9	4	Schuyler, Fulton, Williamson Co.	Wabash Co.
1991	8	5	JoDaviess Co.	Kankakee Co.
1991	0	5	JoDaviess Co.	Iroquois Co.
1991	9	6	Fulton, Johnson, Williamson Co.	Lawrence Co.
1991	10	4	Fulton, Pope, Johnson Co.	Jasper Co.
1991	11	8	JoDaviess Co.	Minnesota
1991	0	3	Pope Co.	Jasper Co.
1991	0	2	JoDaviess Co.	Will Co.
1992	8	6	JoDaviess Co.	Grundy Co.
1992	20	6	JoDaviess, Carroll Co.	Minnesota
1992	6	0	JoDaviess, Carroll Co.	DeWitt Co.
1992	0	2	JoDaviess Co.	Ogle Co.
1992	8	6	JoDaviess, Carroll Co.	Effingham Co.
1992	8	8	JoDaviess Co.	Edgar Co.
1992	10	6	JoDaviess, Carroll Co.	Bond Co.
1992	11	7	Union, Jackson Co.	Randolph Co.
1992	11	4	JoDaviess, Carroll, Union Co.	Monroe Co.
1992	9	5	JoDaviess, Carroll	Montgomery Co.
1992	11	3	JoDaviess, Union Co.	Perry Co.
1992	9	11	JoDaviess, Carroll Co.	Clark Co.
1992	9	7	JoDaviess, Jackson Co.	Jefferson Co.
1992	9	7	JoDaviess, Jackson Co.	Washington Co.
1992	10	7	JoDaviess, Union, Jackson Co.	Perry Co.
1992	9	7	JoDaviess, Carroll Co.	Macon Co.
1992	10	5	JoDaviess, Carroll Co.	Boone Co.
1992	10	8	JoDaviess Co.	Logan Co.
1992	9	4	JoDaviess, Carroll Co.	McHenry Co.
1992	10	5	JoDaviess Co.	Sangamon Co.
1992	11	5	Union, Pope Co.	Williamson Co.
1992	10	6	Union, Jackson Co.	Pulaski Co.
1992	10	4	JoDaviess Co.	Hancock Co.
1992	11	4	JoDaviess Co.	Fulton Co.
1992	8	4	JoDaviess, Carroll Co.	DeKalb Co.
1992	12	5	JoDaviess Co.	Warren Co.
1992	12	4	JoDaviess Co.	Woodford Co.
1992	11	5	JoDaviess Co.	Tazewell Co.
1992	6	2	JoDaviess Co.	Logan Co.
1992	5	8	Jackson Co.	Edwards Co.
1992	8	6	Union, Pope Co.	Massac Co.
1992	9	7	Union, Pope Co.	Massac Co.
1993	10	6	JoDaviess Co.	Piatt Co.
1993	10	5	JoDaviess, Pike, Jackson Co.	Washington Co.
1993	5	2	JoDaviess, Pike Co.	Logan Co.
1993	10	7	JoDaviess, Pike Co.	Moultrie Co.
1993	13	6	JoDaviess Co.	Henry Co.

TABLE 2. SUMMARY OF WILD TRAPPED TURKEY RELEASES IN ILLINOIS, 1959-93
(CONTINUED)

YEAR	NUMBER		TRAP SITE	RELEASE SITE
	HENS	GOBBLERS		
1993	8	7	JoDaviess Co.	Lake Co.
1993	9	4	JoDaviess Co, McDonough, Pike, Jersey Co.	Madison Co.
1993	10	4	JoDaviess, McDonough, Pike, Henderson Co.	Madison Co.
1993	8	4	JoDaviess Co.	Richland Co.
1993	10	5	JoDaviess, Jackson Co.	Richland Co.
1993	11	5	JoDaviess, Jackson Co.	Franklin Co.
1993	11	5	JoDaviess, Henderson, Jackson Co.	Crawford Co.
1993	8	4	JoDaviess Co.	Wayne Co.
1993	10	7	JoDaviess, Ogle, Jackson Co.	Lawrence Co.
1993	8	4	JoDaviess Co.	Mercer Co.
1993	12	9	JoDaviess, Ogle Co.	Ogle Co.
1993	10	4	JoDaviess, Pope, Union Co.	White Co.
1993	8	4	JoDaviess, Ogle, Henderson Co.	Warren Co.
1993	9	5	JoDaviess Co.	Peoria Co.
1993	15	5	JoDaviess, Ogle Co.	Minnesota DNR
1993	5	1	JoDaviess, Cass, Pike Co.	Menard Co.
1993	9	7	Ogle, Jackson Co.	Clinton Co.
1993	9	4	Union, Henderson Co.	Hamilton Co.
TOTAL 1,835+ 963+				187 RELEASE SITES

TABLE 3. FY'94 WILD TURKEY TRAP-TRANSPLANT DATA

RELEASE SITE		TRAP SITE	#BIRDS, AGE, SEX	DATE
Kentucky DNR		JoDaviess Co.	3AM, 13JM, 17F	1/22/94
Kentucky DNR		Henderson Co.	1JM, 2AF, 5JF	1/22/94
Kentucky DNR		Ogle Co.	14AF	1/28/94
Kentucky DNR		JoDaviess Co.	1JM, 4AF, 18JF	1/29/94
Kentucky DNR		Massac Co.	5AM	2/15/94
Moultrie Co.	- T.14N.-R. 4E., SEC. 36	JoDaviess Co.	8AF, 2JF	1/17/94
Moultrie Co.	- T.14N.-R. 4E., SEC. 36	Ogle Co.	6JM	1/22/94
Crawford Co.	- T. 7N.-R.13W., SEC. 11	JoDaviess Co.	2JM, 1JF	1/17/94
Crawford Co.	- T. 7N.-R.13W., SEC. 11	Ogle Co.	1JM, 6AF, 1JF	1/30/94
Crawford Co.	- T. 7N.-R.13W., SEC. 11	JoDaviess Co.	2AM, 2JF	2/02/94
Henry Co.	- T.14N.-R. 3E., SEC. 18	Henderson Co.	5JM	1/31/94
Henry Co.	- T.14N.-R. 3E., SEC. 18	JoDaviess Co.	13AF	1/31/94
Williamson Co.	- T. 8S.-R. 1E., SEC. 9	JoDaviess Co.	2JM, 9AF, 1JF	2/03/94
Williamson Co.	- T. 8S.-R. 1E., SEC. 9	Ogle Co.	4JM	2/02/94
Williamson Co.	- T. 8S.-R. 4E., SEC. 22	JoDaviess Co.	2AF, 2JF	2/03/94
Williamson Co.	- T. 8S.-R. 4E., SEC. 22	Schuyler Co.	5JM, 3AF, 1JF	2/03/94
Williamson Co.	- T. 8S.-R. 4E., SEC. 22	Ogle Co.	1JM, 2JF	2/03/94
Vermilion Co.	- T.19N.-R.12W., SEC. 19	JoDaviess Co.	1JM, 5AF, 4JF	2/04/94
Vermilion Co.	- T.19N.-R.12W., SEC. 19	Winnebago Co.	2AM, 2JM, 1AF	2/15/94
Woodford Co.	- T.25N.-R. 1E., SEC. 3	JoDaviess Co.	16AF, 1JF	2/05/94
Woodford Co.	- T.25N.-R. 1E., SEC. 3	JoDaviess Co.	1JM	2/10/94
Woofford Co.	- T.25N.-R. 1E., SEC. 3	Winnebago Co.	2AM	2/10/94
Woodford Co.	- T.25N.-R. 1E., SEC. 3	JoDaviess Co.	3JM	2/16/94
Minnesota DNR		JoDaviess Co.	2AM, 1JM, 5AF	2/06/94
Edgar Co.	- T.15N.-R.11W., SEC. 36	Ogle Co.	3JM, 6AF, 4JF	2/03/94
Edgar Co.	- T.15N.-R.11W., SEC. 36	Winnebago Co.	2AM	2/15/94
Edwards Co.	- T. 1S.-R.11E., SEC. 6	Ogle Co.	7AF	2/03/94
Stark Co.	- T.14N.-R. 7E., SEC. 29	JoDaviess Co.	11AF	2/10/94
Stark Co.	- T.14N.-R. 7E., SEC. 29	JoDaviess Co.	2AM	2/11/94
Stark Co.	- T.14N.-R. 7E., SEC. 29	Winnebago Co.	2AM	2/10/94
Mason Co.	- T.20N.-R. 7W., SEC. 25	Winnebago Co.	1AM, 3AF	2/15/94
Mason Co.	- T.20N.-R. 7W., SEC. 25	JoDaviess Co.	4AM	2/25/94
Mason Co.	- T.20N.-R. 7W., SEC. 25	Cass Co.	8JF	2/12/94
Mason Co.	- T.20N.-R. 7W., SEC. 25	Cass Co.	3JM	2/28/94
Jackson Co.	- T. 7S.-R. 1W., SEC. 10	JoDaviess Co.	6AF	2/25/94
Jackson Co.	- T. 7S.-R. 1W., SEC. 10	Winnebago Co.	2AF, 2JF	2/15/94
Jackson Co.	- T. 7S.-R. 1W., SEC. 10	Randolph Co.	8JM, 1JF	2/01/94
Jackson Co.	- T. 7S.-R. 1W., SEC. 10	Randolph Co.	2AF, 4JF	2/15/94
Washington Co.	- T. 3S.-R. 2W., SEC. 5	JoDaviess Co.	4AF, 1JF	2/16/94
Washington Co.	- T. 3S.-R. 2W., SEC. 5	JoDaviess Co.	1JM	2/25/94
Washington Co.	- T. 3S.-R. 2W., SEC. 5	Union Co.	3AM	2/22/94
Washington Co.	- T. 3S.-R. 2W., SEC. 5	Randolph Co.	3AF, 4JF	2/15/94
Will Co.	- T.34N.-R. 9E., Jol.Ars.	Ogle Co.	7JM	2/28/94
Will Co.	- T.34N.-R. 9E., Jol.Ars.	Jackson Co.	6AF, 4JF	3/03/94
Christian Co.	- T.14N.-R. 3W., SEC. 18	Cass Co.	4AM, 2JM	2/06/94
Christian Co.	- T.14N.-R. 3W., SEC. 18	Cass Co.	1AF, 7JF	2/12/94
Christian Co.	- T.14N.-R. 3W., SEC. 18	Cass Co.	1AF	2/28/94
Christian Co.	- T.14N.-R. 3W., SEC. 18	Pike Co.	1JM, 2AF, 2JF	2/07/94
Adams Co.		Brown Co.	4JM	2/26/94
Pulaski Co.	- T.16S.-R. 1W., SEC. 9	Williamson Co.	6JM	2/10/94
Pulaski Co.	- T.16S.-R. 1W., SEC. 9	Jackson Co.	3AF, 3JF	2/16/94
Pulaski Co.	- T.16S.-R. 1W., SEC. 9	Union Co.	1AF	2/22/94
Pulaski Co.	- T.16S.-R. 1W., SEC. 9	Jackson Co.	1AF, 2JF	3/03/94
Pulaski Co.	- T.16S.-R. 1W., SEC. 9	Pope Co.	3AM	2/15/94

TABLE 3. FY'93 WILD TURKEY TRAP-TRANSPLANT DATA (CONTINUED)

RELEASE SITE	TRAP SITE	#BIRDS, AGE, SEX ¹	DATE
Jefferson Co. - T. 4S.-R. 1E., SEC. 19	Jackson Co.	1AM, 5JM	2/16/94
Jefferson Co. - T. 4S.-R. 1E., SEC. 19	Jackson Co.	2AF	3/03/94
Jefferson Co. - T. 4S.-R. 1E., SEC. 19	Madison Co.	5AF, 3JF	1/14/94

TOTAL: 127 gobblers and 256 hens were transplanted to 18 new sites
(includes 83 to Kentucky and 8 to Minnesota).

¹

A = Adult; J = Juvenile; M = Male; F = Female

LOCATION _____, _____
(TOWNSHIP) (SECTIONS)

ZIP CODE

RETURN OF THE WILD TURKEY
TO _____ COUNTY

The Illinois Department of Conservation recently announced plans to stock wild turkeys in _____ County. The Department of Conservation is trying to re-establish the wild turkey throughout the state in areas that contain suitable habitat. They feel that _____ County has an adequate amount of forested land that will make excellent habitat for wild turkeys.

The wild turkey was originally a native bird found throughout the forested areas of Illinois. It disappeared from the state in the early 1900's. Its disappearance is attributed to conversion of timberland to farmland, heavy logging operations, frequent forest fires, year-round hunting, and increasing numbers of people living in rural areas. The wild turkey simply could not adapt to its rapidly changing environment.

About 1950, wildlife biologists with the Illinois Department of Conservation decided to try to re-establish a wild turkey population in the Shawnee National Forest in Southern Illinois. The U.S. Forest Service had acquired thousands of acres of forest land and had allowed the timber to mature where it was once again suitable for wild turkeys. Wild trapped turkeys were obtained from several southern states and released at several locations in the Shawnee National Forest. The birds increased rapidly and expanded their range. They did so well, in fact, that the Illinois Department of Conservation established its first modern turkey hunting season in the spring of 1970. Turkey hunting was allowed only in Jackson, Union, and Alexander Counties. Pope County was opened in 1972. In 1974, 14 wild turkeys trapped in Union County were released in Calhoun County. They increased so rapidly that the Illinois Department of Conservation was able to open it for hunting during the spring of 1978. Many other states have also had wonderful success in re-establishing the wild turkey to its former range.

The Illinois Department of Conservation is currently trapping wild turkeys in areas that have a good population and transplanting them to new areas throughout the state. Since wild turkeys are very difficult to trap and the cost per bird quite high, this process is progressing at a fairly slow rate. With everyone's cooperation, they will hopefully be successful in re-establishing the wild turkey in all suitable habitat throughout the state.

The initial release of wild turkeys within a given county usually consists of a relatively small number of birds. Jared K. Garver, Forest Game Biologist with the Division of Fish and Wildlife Resources of the Illinois Department of Conservation, says that 10-15 wild turkeys is usually adequate to establish a population in an area. "To be successful, it is imperative that these turkeys be given complete protection for the first 3 or 4 years after stocking," says Garver. "Illegal poaching of turkeys in a newly stocked area, will result in failure to establish a viable population. I cannot stress this point too much."

The release of wild turkeys in _____ County will take place in an area where the interested landowners have agreed to help protect them. "If everything goes well, local hunters can be looking forward to limited hunting opportunities in 4 to 6 years," according to Garver. "These birds are very prolific, and are capable of increasing and expanding their range very rapidly." He cautions though that, "one should not expect to be over-run with turkeys. A population density of 10 to 20 birds per square mile would be normal for an established population."

Figure 3. TURKEY TRAPPING BLINDMATERIALS:

A dark brown or olive green canvas; window in front should be a dark netting material; rubberized or waterproof floor.

DIMENSIONS:

4½ feet high; 4½ feet wide; and 5 feet long (front to back).
Window should be 7" high and 30" wide; centered left to right,
40" from bottom.

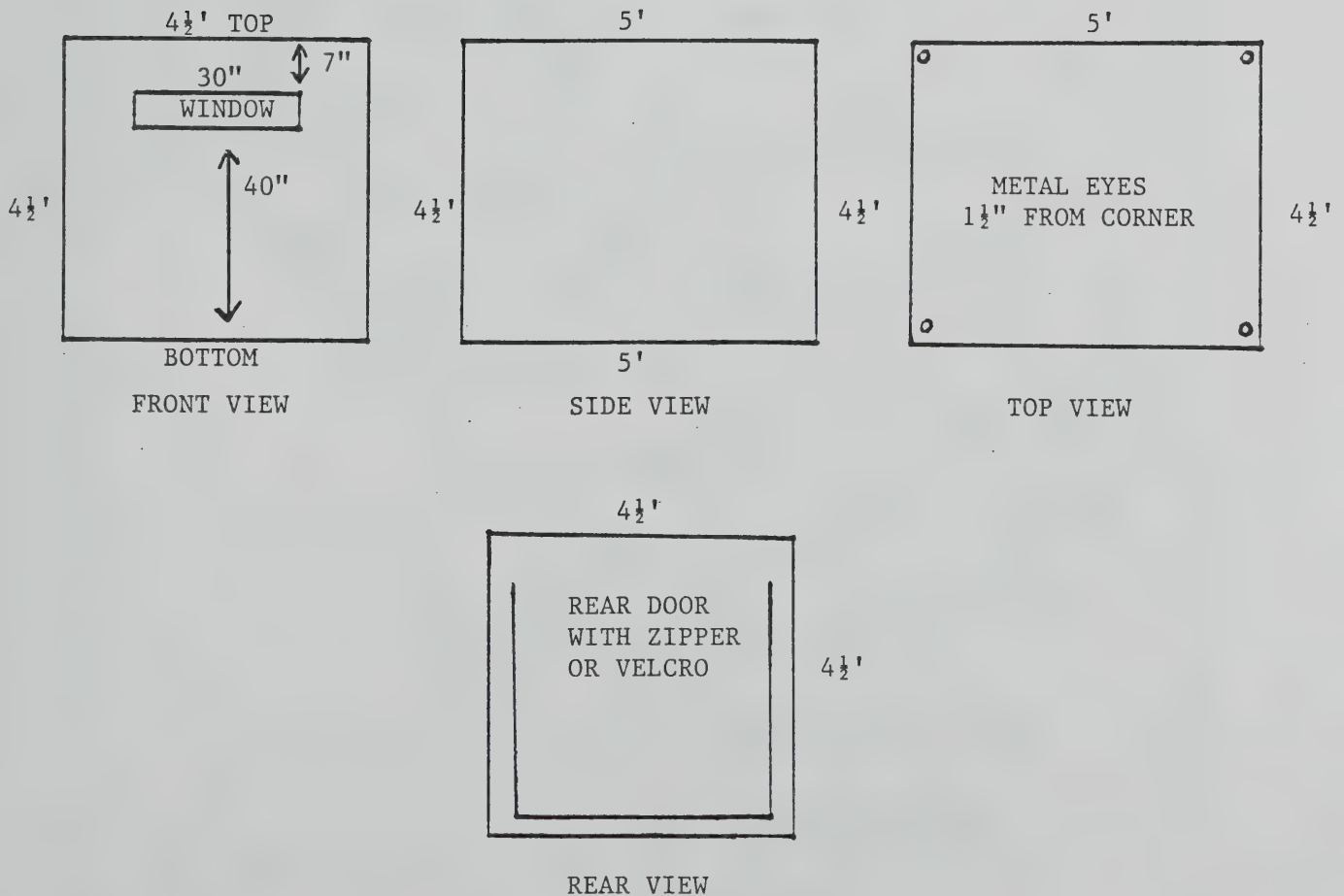
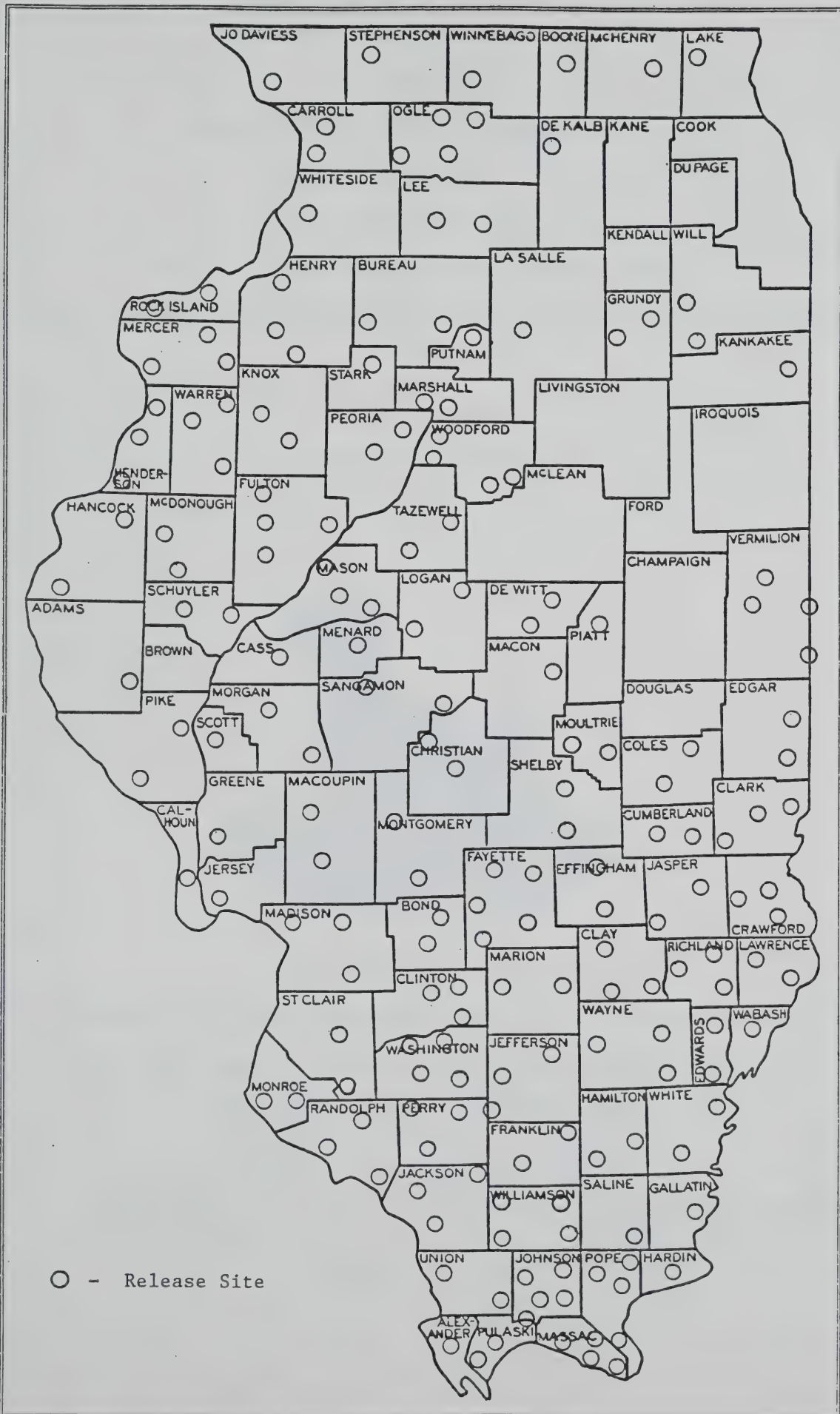


Figure 4. Wild Turkey Release Sites
(1959 - Present)



FINAL REPORT
SURVEYS AND INVESTIGATIONS PROJECTS
As Required By
FEDERAL AID IN WILDLIFE RESTORATION ACT
ILLINOIS

Federal Aid Project W-105-R(5)

STUDY II: POPULATION STUDIES OF WILD TURKEYS

Job IIA: Cooperative Landowner Turkey Brood Survey and Deer Hunter Survey

By

Jared K. Garver

Forest Wildlife Biologist



Brent Manning, Director

Jeffrey M. Ver Steeg, Supervisor, Division of Wildlife Resources

John Buhnerkempe, Section Head, Forest and Grassland Section

ILLINOIS DEPARTMENT OF CONSERVATION

Mike Sweet
P-R Coordinator

Paul Shelton, Supervisor
Forest Wildlife Program

August 16, 1994

PERMISSION TO QUOTE

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FINAL REPORT
SURVEYS AND INVESTIGATIONS PROJECTS

STATE OF ILLINOIS

PROJECT NO: W-105-R(5)

STUDY II: POPULATION STUDIES OF WILD TURKEYS

JOB IIA: Cooperative Landowner Turkey Brood Survey and Deer Hunter Survey

ABSTRACT: A total of 421 broods of wild turkeys were reported in 1993, a decrease of 8.7 percent from 1992. A total of 773 hens and 2,719 poults were reported in 1993 as compared to 839 hens and 2,961 poults in 1992. The poults/hen index for 1993 is 3.51 as compared to 3.53 in 1992.

A total of 5,411 firearm deer hunters reported seeing 64,572 wild turkeys in 94 counties of the state in 1993. This represents an increase of 19 percent in numbers of hunters and an increase of 33 percent in numbers of turkeys seen over 1992. 6.0 percent of the successful deer hunters in these counties reported seeing wild turkeys in 1993 as compared to 5.5 percent in 1992.

Successful archery deer hunters reported seeing 29,926 wild turkeys in 99 counties of the state. This compares to 1992 when archers reported seeing 25,098 wild turkeys in 99 counties of the state. Of the successful archers in 1993, 10.1 percent reported seeing wild turkeys.

FINAL REPORT

SURVEYS AND INVESTIGATIONS PROJECTS

STATE OF ILLINOIS

PROJECT NO: W-105-R(5)

STUDY: POPULATION STUDIES OF WILD TURKEYS

Objective: To determine population trends and characteristics of the wild turkey population and to monitor expansion of populations.

Procedures: Data on annual wild turkey reproduction is obtained through questionnaires mailed to cooperators within the occupied turkey range of the state. Most of the cooperators are landowners living within turkey range. Other cooperators include rural mail carriers, biologists, Conservation Police Officers, and area managers. Each cooperator is mailed a survey card during June, July and August to return at the end of each month if they had seen any hens and/or poults. Cards were mailed to 1,805 cooperators in 1993 (Figure 1).

Cooperators are also asked to list the names of other individuals who see turkeys and would like to be included as a new cooperator.

The annual poults/hen index, representing the number of poults observed per hen observed, is calculated using the formula:

$$\text{Poults/Hen Index} = \frac{\text{Total Number of Poults Reported}}{\text{Total Number of Hens Reported}}$$

New cooperators are added annually at new release sites from the list of names on our required "Wild Turkey Stocking Petition."

All successful hunters during the firearm deer season are required to check their deer at a county check station. Each hunter, in selected counties, is questioned on sightings of wild turkeys while deer hunting. The number of turkeys seen and their location is recorded by Township, Range and Section within a county.

The percentage of hunters seeing turkeys is calculated from the data using the formula:

$$\begin{aligned} &\% \text{ of Hunters Seeing Turkeys} = \\ &\frac{\text{Total \# of Hunters Seeing Turkeys}}{\text{Total \# of Successful Hunters}} \end{aligned}$$

The numbers of wild turkeys reported and their locations are recorded on county highway maps to determine annual expansion of populations.

All successful hunters during the archery deer season are required to check their deer at a check station. Each hunter is questioned on sightings of wild turkeys while deer hunting.

Findings

and Analysis: A total of 421 broods were reported during the summer of 1993. These broods were accompanied by one or more hens. Disposition of broods by county is shown in Table 1. Brood observations decreased by 8.7% in 1993 from 1992 when a total of 461 broods were reported.

A total of 773 hens were reported in 1993 (Table 2). This is a decrease of 7.9 percent from 1992 when cooperators reported 839 hens. The total number of poults observed decreased from 2,961 in 1992 to 2,719 in 1993, a decrease of 8.2 percent. The calculated poults/hen index for 1993 is 3.51 (Table 2). This is a 0.6 percent decrease from 1992 when the index was 3.53.

55.5 percent of 218 observers indicated an increase in the turkey population in their area. 31.7 percent reported no change while 12.8 percent believed there was a decrease in the numbers of wild turkeys (Table 3). This compares to 1992 when 68.6 percent of observers indicated more turkeys in their area. Expanding populations in recently stocked counties with newer, more enthusiastic cooperators undoubtedly bias this data when looked at on a statewide basis. However, on a county basis, I feel that these opinions are valid indicators of population trends in those counties where an adequate amount of data is collected.

The poults/hen index of 3.51 for 1993 is below average. We started collecting this data in 1979 (Table 4). This is 19.3% below the 15 year mean.

Information on turkey sightings by firearm deer hunters was first collected in 1978. During that year, turkeys were observed by deer hunters in 25 counties of the state. Since 1978, the number of counties reporting turkeys has risen to a high of 94 in 1993. This expansion of the turkey range is shown in Table 6.

A total of 5,411 hunters reported seeing 64,572 wild turkeys in 1993. This represents an increase of 19 percent in numbers of hunters and an increase of 33 percent in numbers of turkeys seen over 1992.

6.0 percent of the successful deer hunters reported seeing turkeys in 1993 as compared to 5.5 percent in 1992, an increase of 9.1 percent. Naturally, counties with established populations over a sizable area generally show a higher percentage of deer hunters seeing turkeys than those recently stocked counties with small, concentrated populations (Table 5). Another important factor that affects this index is the distribution of deer hunters within a county as compared to the turkey range. While the total number of birds reported may be indicative of the overall population trend, the percent of hunters observing turkeys may be a more reliable indicator in determining actual population trends.

When combined, the brood survey data and deer hunter survey data are very helpful in documenting reproduction in newly stocked counties and monitoring range expansion in all counties. This data is also very important in determining when to open a new county to turkey hunting.

As in 1992, successful archery deer hunters were required to check their deer at archery check stations in 1993. In 1993, archers reported seeing wild turkeys in 99 counties of the state (Table 7). A total of 29,926 turkeys were reported. 10.1 percent of the successful archers reported seeing wild turkeys during the 1993 Archery Deer Season as compared to 9.9% in 1992, an increase of 2.0 percent.

Recommendations:

Continue both surveys as they are currently being carried out. Additional cooperators for the brood survey should be enlisted at new release sites. Returned brood survey cards received for the past 4 years should be compared to the list of cooperators to eliminate those people not reporting any sightings during that period.

Serious consideration will be given to opening Menard, Peoria, Madison, Perry and Wayne counties to turkey hunting in 1995.

These two surveys are providing us necessary and reliable data that allows us to better manage the Illinois wild turkey population. When combined with our harvest data, we feel that we have an adequate amount of reliable information on our statewide turkey population.

A total of \$9,680 was spent in carrying out these two surveys. This includes tabulation of data, writing of reports and evaluation of data.

Data and Reports: Original data and related reports in this investigation are on file in the Division of Wildlife Resources office of the Illinois Department of Conservation, Union County Refuge, Jonesboro, IL 62952.

TABLE 1. BROODS REPORTED BY COUNTY, 1993

COUNTY	JUNE	JULY	AUGUST
ADAMS	0	0	1
BOND	0	1	1
BROWN	1	1	1
BOONE	0	1	0
BUREAU	5	3	3
CALHOUN	0	1	1
CARROLL	8	13	17
CASS	0	0	4
CLARK	0	0	5
CLINTON	0	1	7
COLES	0	5	7
CRAWFORD	1	0	0
CUMBERLAND	3	0	0
DEKALB	0	1	0
DEWITT	0	0	1
EDWARDS	0	5	7
FAYETTE	2	1	1
FRANKLIN	2	0	0
FULTON	1	1	10
GALLATIN	0	0	2
GREENE	1	0	0
GRUNDY	1	0	1
HAMILTON	6	0	1
HANCOCK	2	0	2
HARDIN	2	0	0
HENDERSON	1	3	0
HENRY	0	2	0
JACKSON	0	0	2
JASPER	4	0	2
JEFFERSON	2	1	0
JERSEY	3	4	4
JODAVIESS	0	1	0
JOHNSON	1	0	1
KNOX	3	7	5
LASALLE	3	1	0
LAWRENCE	0	3	0
LEE	13	7	11
MACOUPIN	0	0	3
MADISON	0	0	1
MARION	0	9	4
MARSHALL	1	0	9
MASON	0	5	7
MASSAC	1	5	6
MCDONOUGH	2	2	5
MERCER	0	2	3
MORGAN	0	0	4
OGLE	2	0	0
PEORIA	0	2	2
POPE	4	1	12
PUTNAM	2	0	0
RANDOLPH	0	1	1
SALINE	2	2	3
SCHUYLER	0	2	0
SCOTT	6	7	14
SHELBY	0	0	1

TABLE 1. BROODS REPORTED BY COUNTY, 1993 (CONTINUED)

COUNTY	JUNE	JULY	AUGUST
ST. CLAIR	3	3	0
STEPHENSON	5	2	7
UNION	5	3	1
VERMILION	2	5	6
WABASH	1	0	0
WARREN	4	3	4
WASHINGTON	0	0	1
WHITE	0	1	1
WILLIAMSON	1	1	2
WOODFORD	1	1	0
SUBTOTAL	107	120	194
%	25.4	28.5	46.1
TOTAL	421		
%	100		

TABLE 2. WILD TURKEY BROODS AND HEN OBSERVATIONS, 1993

COUNTY	# HENS (WITH & WITHOUT BROODS)	# POULTS	POULTS PER HEN
ADAMS	1	4	4.00
BOND	6	4	0.67
BOONE	2	4	2.00
BROWN	6	22	3.67
BUREAU	20	71	3.55
CALHOUN	2	11	5.50
CARROLL	80	217	2.71
CASS	4	29	7.25
CLARK	8	33	4.12
CLINTON	11	47	4.27
COLES	23	72	3.13
CRAWFORD	10	12	1.20
CUMBERLAND	6	22	3.67
DEKALB	7	7	1.00
DEWITT	5	10	2.00
EDWARDS	13	83	6.38
EFFINGHAM	1	0	0.00
FAYETTE	5	21	4.20
FRANKLIN	2	16	8.00
FULTON	24	72	3.00
GALLATIN	2	12	6.00
GREENE	3	6	2.00
GRUNDY	3	13	4.33
HAMILTON	7	44	6.29
HANCOCK	10	21	2.10
HARDIN	8	9	1.13
HENDERSON	13	51	3.92
HENRY	4	17	4.25
JACKSON	2	12	6.00
JASPER	10	33	3.30
JEFFERSON	7	25	3.57
JERSEY	11	77	7.00
JODAVIESS	2	2	1.00
JOHNSON	2	8	4.00
KNOX	29	106	3.66
LASALLE	7	17	2.43
LAWRENCE	5	14	2.80
LEE	45	202	4.49
MACOUPIN	6	15	2.50
MADISON	11	3	0.27
MARION	35	126	3.60
MARSHALL	20	56	2.80
MASON	15	63	4.20
MASSAC	19	87	4.58
MCDONOUGH	14	46	3.29
MERCER	6	34	5.67
MONROE	1	0	0.00
MONTGOMERY	3	0	0.00
MORGAN	6	20	3.33
OGLE	2	25	12.50
PEORIA	14	18	1.29
PIKE	3	0	0.00
POPE	29	111	3.83
PUTNAM	6	15	2.50
RANDOLPH	3	28	9.33

TABLE 2. WILD TURKEY BROODS AND HEN OBSERVATIONS, 1993
(CONTINUED)

COUNTY	# HENS (WITH & WITHOUT BROODS)	# POULTS	POULTS PER HEN
ROCK ISLAND	2	0	0.00
SALINE	16	35	2.19
SCHUYLER	5	11	2.20
SCOTT	37	214	5.78
SHELBY	2	3	1.50
ST. CLAIR	11	36	3.27
STEPHENSON	19	84	4.42
UNION	17	58	3.41
VERMILION	19	74	3.89
WABASH	2	3	1.50
WARREN	21	88	4.19
WASHINGTON	2	3	1.50
WHITE	5	8	1.60
WILL	1	0	0.00
WILLIAMSON	12	21	1.75
WOODFORD	3	8	2.67
STATEWIDE	773	2,719	3.51

TABLE 3. OPINIONS OF COOPERATORS ON NUMBER OF WILD TURKEYS, 1993

COUNTY	MORE	SAME	FEWER
ADAMS	1	0	0
ALEXANDER	0	1	0
BOND	2	1	0
BOONE	1	1	0
BROWN	0	0	1
BUREAU	2	1	3
CALHOUN	1	0	0
CARROLL	4	7	2
CASS	1	0	0
CLARK	0	2	0
CLINTON	3	0	0
COLES	3	2	0
CRAWFORD	3	0	0
CUMBERLAND	1	0	0
DEKALB	1	0	1
DEWITT	2	0	0
EDWARDS	4	2	0
EFFINGHAM	0	1	0
FAYETTE	0	1	0
FRANKLIN	1	0	0
FULTON	3	3	2
GALLATIN	1	0	0
GREENE	1	1	0
GRUNDY	2	0	0
HAMILTON	2	0	0
HANCOCK	2	0	0
HARDIN	0	1	1
HENDERSON	1	2	0
HENRY	3	1	0
JACKSON	0	1	0
JASPER	3	1	0
JEFFERSON	3	0	0
JERSEY	1	1	0
JODAVIESS	0	1	0
JOHNSON	0	1	0
KNOX	4	4	0
LASALLE	0	1	0
LAWRENCE	2	0	0
LEE	6	3	1
MACOUPIN	1	0	1
MADISON	1	3	0
MARION	2	2	2
MARSHALL	1	0	1
MASON	2	0	0
MASSAC	6	1	0
MCDONOUGH	2	1	0
MERCER	1	1	0
MONROE	0	1	0
MONTGOMERY	0	1	0
MORGAN	1	0	0
OGLE	1	0	0
PEORIA	1	0	0
PIKE	0	0	2
POPE	0	5	0
PUTNAM	1	1	0
RANDOLPH	3	0	0

TABLE 3. OPINIONS OF COOPERATORS ON NUMBER OF WILD TURKEYS, 1993
(CONTINUED)

COUNTY	MORE	SAME	FEWER
ROCK ISLAND	0	0	1
SALINE	1	2	1
SCHUYLER	0	1	1
SCOTT	4	1	2
SHELBY	1	0	0
ST. CLAIR	3	0	0
STEPHENSON	4	0	1
UNION	0	4	2
VERMILION	7	1	0
WABASH	0	1	0
WARREN	10	0	0
WASHINGTON	1	0	0
WHITE	0	0	1
WHITESIDE	1	0	0
WILL	1	0	0
WILLIAMSON	0	2	1
WOODFORD	1	1	1
<hr/>			
SUBTOTAL	121	69	28
%	55.5	31.7	12.8
<hr/>			
TOTAL	218		
%	100		

TABLE 4. WILD TURKEY BROODS AND HEN OBSERVATIONS, (1979-1993)

YEAR	# HENS (WITH & WITHOUT BROODS)	# POULTS	POULTS/HEN INDEX
1979	115	772	6.71
1980	226	1,016	4.50
1981	228	1,192	5.23
1982	169	800	4.73
1983	164	661	4.03
1984	265	1,180	4.45
1985	376	2,046	5.44
1986	441	1,469	3.33
1987	480	2,101	4.38
1988	412	1,449	3.52
1989	441	1,924	4.36
1990	712	2,580	3.62
1991	890	3,476	3.91
1992	839	2,961	3.53
1993	773	2,719	3.51
AVERAGE	436	1,757	4.35

TABLE 5. SIGHTINGS OF WILD TURKEYS BY SUCCESSFUL DEER HUNTERS, 1993

COUNTY	NO. OF HUNTERS	NO. OF HUNTERS SEEING TURKEYS	TOTAL NO. SEEN	AVG. NO. OF BIRDS SEEN	% OF HUNTERS SEEING TURKEYS	CHANGE IN % FROM 1992
ADAMS	3,082	307	3,181	10.4	10.0	-0.2
ALEXANDER	308	15	115	7.7	4.9	-2.7
BOND	732	41	600	14.6	5.6	+2.6
BOONE	320	15	118	7.9	4.7	-0.4
BROWN	1,710	119	1,528	12.8	7.0	+2.9
BUREAU	1,017	46	572	12.4	4.5	-1.3
CALHOUN*	937	18	411	22.8	1.9	-7.7
CARROLL	1,032	204	3,367	16.5	19.8	+3.7
CASS	744	73	923	12.6	9.8	+3.8
CHAMPAIGN	247	1	2	2.0	0.4	+0.4
CHRISTIAN	472	7	19	2.7	1.5	-0.2
CLARK	955	20	129	6.5	2.1	-0.2
CLAY	890	40	511	12.8	4.5	-1.2
CLINTON	465	7	28	4.0	1.5	-0.6
COLES	501	20	123	6.2	4.0	+0.3
CRAWFORD	1,084	33	139	4.2	3.0	+0.9
CUMBERLAND	593	16	140	8.8	2.7	-3.0
DEKALB	365	6	50	8.3	1.6	+0.7
DEWITT	400	8	85	10.6	2.0	-1.0
EDGAR	540	4	36	9.0	0.7	-0.9
EDWARDS	497	15	99	6.6	3.0	+0.6
EFFINGHAM	649	15	115	7.7	2.3	-4.8
FAYETTE	1,531	38	190	5.0	2.5	-1.2
FRANKLIN	812	10	40	4.0	1.2	-0.3
FULTON	1,869	85	1,077	12.7	4.5	+1.3
GALLATIN	594	18	365	20.3	3.0	-5.7
GREENE	1,227	110	1,419	12.9	9.0	+1.6
GRUNDY	538	13	132	10.2	2.4	+0.5
HAMILTON	777	40	326	8.2	5.1	+2.3
HANCOCK	1,589	327	3,434	10.5	20.6	+1.5
HARDIN	848	53	518	9.8	6.3	+1.5
HENDERSON	633	140	1,802	12.9	22.1	+8.1
HENRY	621	10	330	33.0	1.6	-0.5
IROQUOIS	739	7	13	1.9	0.9	-0.2
JACKSON	2,683	145	1,033	7.1	5.4	-0.7
JASPER	1,096	44	257	5.8	4.0	+1.6

TABLE 5. SIGHTINGS OF WILD TURKEYS BY SUCCESSFUL DEER HUNTERS, 1993 (CONTINUED)

COUNTY	NO. OF HUNTERS	NO. OF HUNTERS SEEING TURKEYS	TOTAL NO. SEEN	AVG. NO OF BIRDS SEEN	% OF HUNTERS SEEING TURKEYS	CHANGE IN % FROM 1992
JEFFERSON	1,533	40	305	7.6	2.6	+0.4
JERSEY	583	63	555	8.8	10.8	-3.9
JODAVIESS	2,578	616	12,762	20.7	23.9	-0.1
JOHNSON	2,247	51	374	7.3	2.3	-0.5
KANKAKEE	221	5	8	1.6	2.3	-0.1
KNOX	1,111	91	1,304	14.3	8.2	-0.6
LASALLE	1,153	22	279	12.7	1.9	+1.2
LAWRENCE	670	29	241	8.3	4.3	+1.6
LEE	715	64	490	7.7	9.0	-0.2
LOGAN	377	11	133	12.1	2.9	+0.6
MACON	220	7	13	1.9	3.2	+2.7
MACOUPIN	1,595	73	554	7.6	4.6	-0.6
MADISON	781	29	118	4.1	3.7	-1.1
MARION	1,058	62	298	4.8	5.9	+3.5
MARSHALL	598	13	53	4.1	2.2	+0.3
MASON	535	59	902	15.3	11.0	+1.3
MASSAC	391	11	109	9.9	2.8	-0.4
MCDONOUGH	831	51	596	11.7	6.1	+0.3
MCHEMRY	765	7	22	3.1	0.9	-0.3
MCLEAN	810	18	333	18.5	2.2	+1.4
MENARD	443	46	376	8.2	10.4	+4.7
MERCER	684	50	309	6.2	7.3	-2.4
MONROE	808	23	290	12.6	2.8	-3.6
MONTGOMERY	1,156	12	111	9.3	1.0	-0.4
MORGAN	1,151	170	2,844	16.7	14.8	+6.2
MOULTRIE	199	3	4	1.3	1.5	-0.4
OGLE	1,421	59	481	8.2	4.2	-1.3
PEORIA	1,034	44	360	8.2	4.3	+0.7
PERRY	1,675	54	429	7.9	3.2	+1.9
PIATT	149	6	9	1.5	4.0	+3.2
PIKE	3,915	263	2,662	9.9	6.7	+1.4
POPE	2,215	124	1,377	11.1	5.6	-0.1
PULASKI	767	24	273	11.4	3.1	+0.8
PUTNAM	385	14	291	20.8	3.6	+0.3
RANDOLPH*	2,109	51	589	7.0	2.4	-2.4
RICHLAND	699	26	200	7.7	3.7	+2.6
ROCK ISLAND	645	66	546	8.3	10.2	+0.7
SALINE	639	12	119	9.9	1.9	-2.0

TABLE 5. SIGHTINGS OF WILD TURKEYS BY SUCCESSFUL DEER HUNTERS, 1993 (CONTINUED)

COUNTY	NO. OF HUNTERS	NO. OF HUNTERS SEEING TURKEYS	TOTAL NO. SEEN	AVG. NO OF BIRDS SEEN	% OF HUNTERS SEEING TURKEYS	CHANGE IN % FROM 1992
SANGAMON	727	15	129	8.6	2.1	+0.3
SCHUYLER	1,549	236	2,809	11.9	15.2	+2.3
SCOTT	638	62	859	13.9	9.7	+5.1
SHELBY	1,147	27	133	4.9	2.4	+0.6
ST. CLAIR	987	58	377	6.5	5.9	-0.5
STARK	194	3	9	3.0	1.5	-0.9
STEPHENSON	1,161	114	1,947	17.1	9.8	-0.1
TAZEWELL	706	22	210	9.5	3.1	-1.7
UNION	2,103	67	491	7.3	3.2	-0.2
VERMILION	884	30	238	7.9	3.4	+1.3
WABASH	287	5	8	1.6	1.7	-0.3
WARREN	534	36	218	6.1	6.7	+2.8
WASHINGTON	1,064	38	290	7.6	3.6	+1.6
WAYNE	1,168	17	322	18.9	1.5	-0.7
WHITE	874	11	86	7.8	1.3	-0.1
WHITESIDE	823	57	847	14.9	6.9	-2.2
WILL	343	7	133	19.0	2.0	-0.3
WILLIAMSON	1,976	88	417	4.7	4.5	+1.2
WINNEBAGO	789	49	509	10.4	6.2	+2.7
WOODFORD	857	29	194	6.7	3.4	+1.8
STATEWIDE	90,768	5,411	64,572	11.9	6.0	+0.5

* Incomplete data for Calhoun and Randolph counties.

TABLE 6. SIGHTINGS OF WILD TURKEYS BY SUCCESSFUL DEER HUNTERS, 1978-1993

YEAR	NO. OF COUNTIES*	NO. OF HUNTERS	NO. OF HUNTERS SEEING TURKEYS	TOTAL NO. SEEN	% OF HUNTERS SEEING TURKEYS	AVERAGE NO. SEEN
1978	25	9,051	189	1,437	2.1%	7.6
1979	32	11,162	297	3,102	2.7%	10.4
1980	37	12,390	356	3,139	2.9%	8.8
1981	39	12,172	427	4,049	3.5%	9.5
1982	47	16,577	590	4,325	3.6%	7.3
1983	44	17,550	601	5,676	3.4%	9.4
1984	40	18,427	672	5,364+	3.6%	8.0
1985	53	22,063	755	7,099	3.4%	9.4
1986	60	27,931	1,163	11,557	4.2%	9.9
1987	53	31,619	1,383	15,404	4.4%	11.1
1988	63	37,932	1,746	22,972	4.6%	13.2
1989	73	49,070	2,962	34,749	6.0%	11.7
1990	78	60,074	3,734	40,722	6.2%	10.9
1991	91	79,092	4,188	53,796	5.3%	12.8
1992	93	82,464	4,547	48,432	5.5%	10.7
1993	94	90,768	5,411	64,572	6.0%	11.9

* Counties reporting turkeys

TABLE 7. SIGHTINGS OF WILD TURKEYS BY ARCHERY DEER HUNTERS, 1993

COUNTY	NO. OF SUCCESSFUL HUNTERS	NO. OF HUNTERS SEEING TURKEYS	TOTAL NO. OF TURKEYS SEEN	AVERAGE NO. OF BIRDS SEEN	% OF HUNTERS SEEING TURKEYS
ADAMS	182	30	502	16.7	16.5
ALEXANDER	50	2	6	3.0	4.0
BOND	143	20	371	18.6	14.0
BOONE	129	4	8	2.0	3.1
BROWN	196	33	553	16.8	16.8
BUREAU	196	23	310	13.5	11.7
CALHOUN	108	16	244	15.3	14.8
CARROLL	193	47	751	16.0	24.4
CASS	124	31	514	16.6	25.0
CHAMPAIGN	174	1	1	1.0	0.6
CHRISTIAN	149	4	45	11.3	2.7
CLARK	156	10	72	7.2	6.4
CLAY	159	22	228	10.4	13.8
CLINTON	102	11	72	6.5	10.8
COLES	162	8	116	14.5	4.9
COOK	111	2	2	1.0	1.8
CRAWFORD	297	44	397	9.0	14.8
CUMBERLAND	121	19	211	11.1	15.7
DEKALB	140	14	286	20.4	10.0
DEWITT	132	13	56	4.3	9.8
DOUGLAS	66	2	18	9.0	3.0
DUPAGE	70	1	1	1.0	1.4
EDGAR	180	5	49	9.8	2.8
EDWARDS	99	11	78	7.1	11.1
EFFINGHAM	145	15	285	19.0	10.3
FAVETTE	256	30	419	14.0	11.7
FRANKLIN	207	4	17	4.3	1.9
FULTON	344	25	184	7.4	7.3
GALLATIN	80	3	58	19.3	3.8
GREENE	124	7	123	17.6	5.6
GRUNDY	219	11	81	7.4	5.0
HAMILTON	94	9	34	3.8	9.6
HANCOCK	167	47	679	14.4	28.1
HARDIN	117	14	195	13.9	12.0

TABLE 7. SIGHTINGS OF WILD TURKEYS BY ARCHERY DEER HUNTERS, 1993 (CONTINUED)

COUNTY	NO. OF SUCCESSFUL HUNTERS	NO. OF HUNTERS SEEING TURKEYS	TOTAL NO. OF TURKEYS SEEN	AVERAGE NO. OF BIRDS SEEN	% OF HUNTERS SEEING TURKEYS
HENDERSON	94	40	642	16.1	42.6
HENRY	163	23	522	22.7	14.1
IROQUOIS	328	5	10	2.0	1.5
JACKSON	423	39	558	14.3	9.2
JASPER	221	20	114	5.7	9.0
JEFFERSON	416	25	173	6.9	6.0
JERSEY	152	38	518	13.6	25.0
JODAVIESS	222	74	1,147	15.5	33.3
JOHNSON	375	18	207	11.5	4.8
KANE	181	2	5	2.5	1.1
KANKAKEE	97	2	18	9.0	2.1
KNOX	221	26	323	12.4	11.8
LAKE	478	5	22	4.4	1.0
LASALLE	515	38	436	11.5	7.4
LAWRENCE	173	36	449	12.5	20.8
LEE	132	23	319	13.9	17.4
LIVINGSTON	127	4	8	2.0	3.1
LOGAN	116	10	121	12.1	8.6
MACON	200	4	22	5.5	2.0
MACOUPIN	329	34	288	8.5	10.3
MADISON	254	28	296	10.6	11.0
MARION	264	39	565	14.5	14.8
MARSHALL	66	5	18	3.6	7.6
MASON	250	45	1,241	27.6	18.0
MASSAC	121	7	52	7.4	5.8
MCDONOUGH	134	15	233	15.5	11.2
MCHENRY	570	9	47	5.2	1.6
MCLEAN	309	10	89	8.9	3.2
MENARD	90	20	516	25.8	22.2
MERCER	52	4	13	3.3	7.7
MONROE	71	4	42	10.5	5.6
MONTGOMERY	254	10	40	4.0	3.9
MORGAN	243	64	937	14.6	26.3
MOULTRIE	79	4	25	6.3	5.1

Figure 1. Turkey Brood Survey Card

WILD TURKEY CENSUS

BROOD #1 _____ Hen(s) _____ Poults. Date Seen: _____

Size: 1/4 _____ 1/2 _____ 3/4 _____ Grown _____

BROOD #2 _____ Hen(s) _____ Poults. Date Seen: _____

Size: 1/4 _____ 1/2 _____ 3/4 _____ Grown _____

BROOD #3 _____ Hen(s) _____ Poults. Date Seen: _____

Size 1/4 _____ 1/2 _____ 3/4 _____ Grown _____

How many adult hens have you seen without broods? _____ Date _____

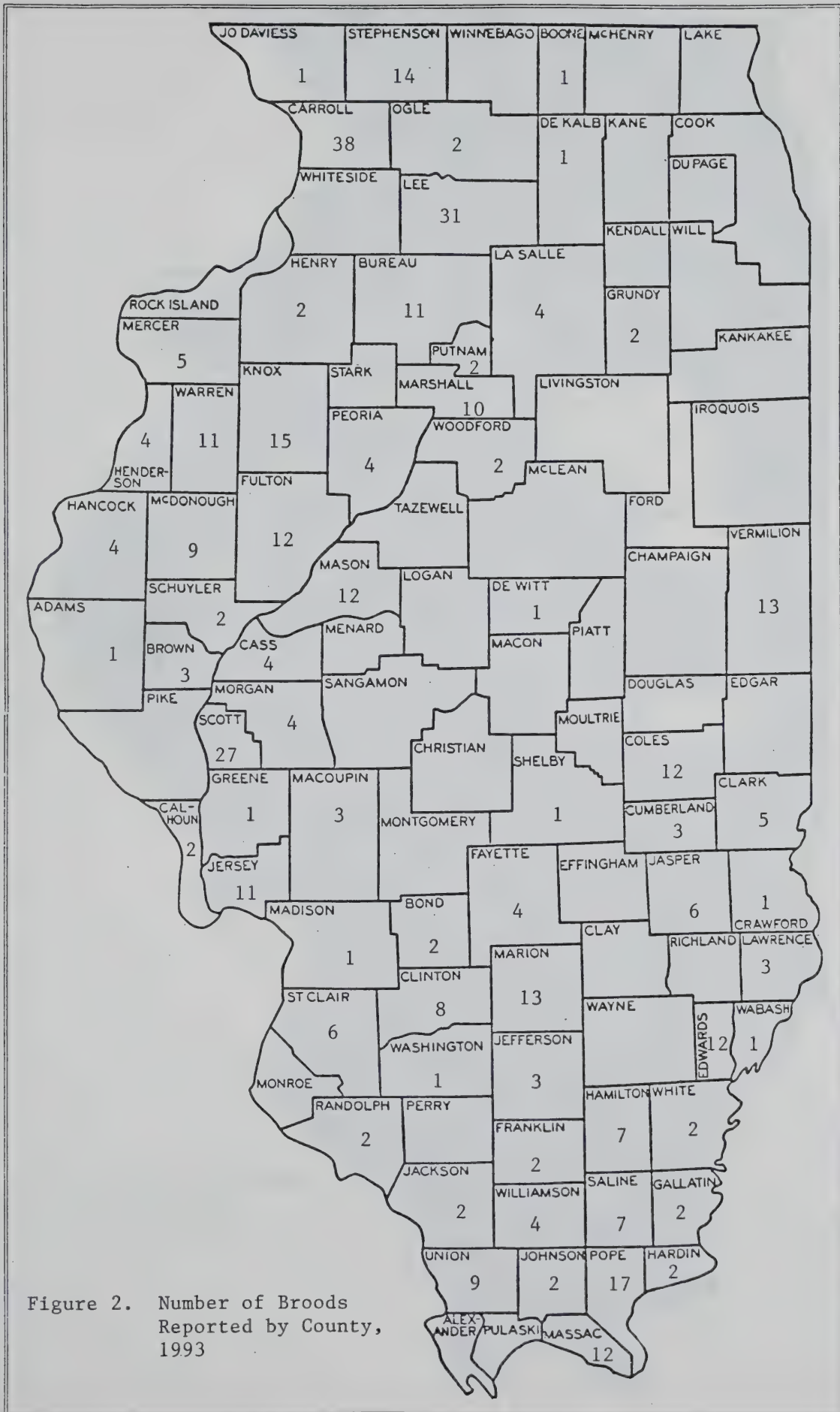
Are there fewer _____ more _____ or the same _____ number of turkeys
in your area this year as compared to last?

COMMENTS:

NAME: _____

ADDRESS _____ COUNTY _____

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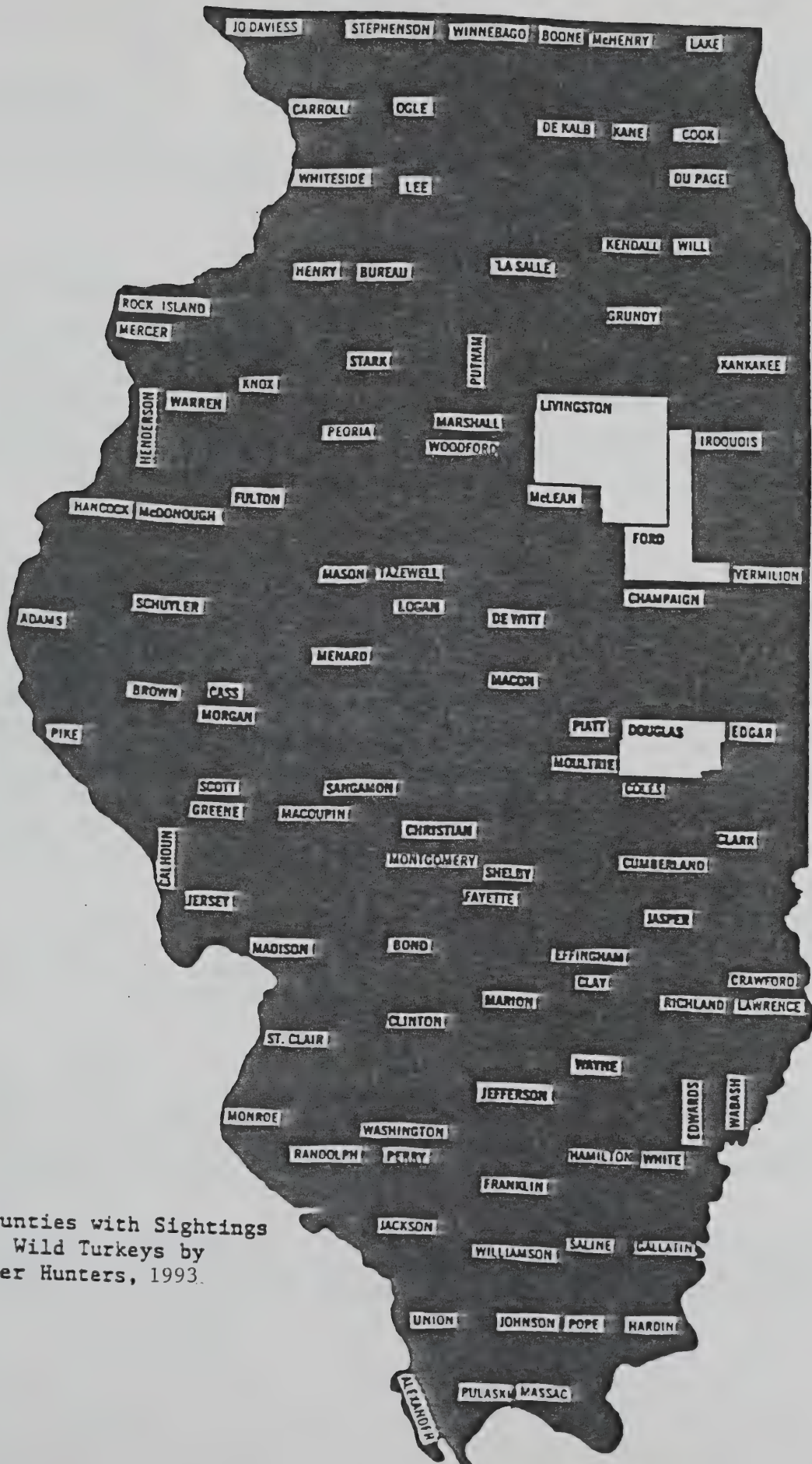


Figure 3. Counties with Sightings of Wild Turkeys by Deer Hunters, 1993.

STATE OF ILLINOIS

PROJECT NO.: W-105-R

STUDY VII: Population Studies and Restocking of Ruffed Grouse
in Illinois

A. Problem:

The Department of Conservation needs to evaluate existing grouse populations on a statewide basis. The Illinois Ruffed Grouse Project requires further evaluation of past stocking problems, identification of existing habitat, determination of grouse habitat needs specific to Illinois. Sources of grouse for restoration efforts need to be developed with surrounding states and trade agreements with Minnesota are in need of renegotiation.

B. Objective:

To restore viable populations of ruffed grouse to its historic Illinois range, where suitable habitat exists.

C. Justification:

The main function of the Ruffed Grouse Project is to restore a once native species to the State of Illinois. Annual drumming and sighting card surveys will assist in determining the current status of grouse, reason for past stocking problems, identification of productive habitats, and identification of range expansion. Monitoring release sites should improve the manager's ability to enhance chances for the successful restoration of grouse in Illinois.

To continue the reintroduction of grouse in suitable areas throughout the state requires a source of ruffed grouse. Therefore, agreements with states that have a surplus of grouse must be developed and negotiated.

D. Status:

Native populations of ruffed grouse declined drastically in the late 1800's and early 1900's. A single grouse sighting in 1937 in Pope County was the last time ruffed grouse was recorded in Illinois prior to the Department of Conservation restoration efforts.

From 1953 to 1959, Illinois made several attempts to reestablish grouse in the southern part of the state. During this period, slightly more than 300 grouse were obtained from Wisconsin and

Michigan and released in Pope county. Scattered sightings were reported in four southern Illinois counties up to 1963. The very low densities occurring in this grouse population are attributed to the affect of too great a change in habitat and climate into which the birds were introduced. Since there were no known sightings of ruffed grouse in southern Illinois from 1964-67, the Illinois Department of Conservation initiated a further attempt to reintroduce grouse in the fall of 1967. A total of 31 wild trapped ruffed grouse were obtained from southern Ohio and released at a single location in Pope County. During September of 1972, we obtained 42 ruffed grouse from Indiana through a mutual trade agreement. These birds were released in the northern part of Alexander County. Drumming grouse were last documented in these counties during the spring of 1991. These populations persist at low densities.

In 1982 and 1983 grouse releases of 120 and 22 Indiana birds respectively commenced in Shawnee National Forest, Union County. A follow-up release occurred in 1986 with the liberation of 71 Indiana grouse. During the 1993 drumming surveys, a total of 6 grouse were heard, these birds persist in close association with clearcut areas. The minimal success of this release is thought to be caused by the lack of sufficient habitat for the birds to disperse into.

In an effort to establish grouse in a new area of the state, releases were conducted in Jo Daviess County. From 1989 to 1992, 181 Minnesota grouse have been released in the west central portion of the county. The Department's latest drumming surveys (1994) located 4 birds.

Trade agreements with other states historically were composed of 3 grouse for 1 wild turkey. Currently, all contracts have been completed. However, Minnesota is willing to renew a ruffed grouse/wild turkey trade. The development of trades with other states are presently unlikely due to a low in grouse population cycles.

The Department has learned from past releases several factors that lead to very low grouse densities. By utilizing newfound knowledge pertaining to the habitat preference of the grouse and required number of birds for a release, the probability that grouse can maintain a viable population at new release sites has been enhanced. Initial habitat analyses have located several sites with the characteristics that are conducive for grouse.

E. Procedures:

Job VIIA Ruffed Grouse Drumming Surveys

Objective: To evaluate survival, dispersal, and reproductive productivity of reintroduced ruffed grouse.

Abstract 1994 Segment:

During April of 1994, IDOC personnel surveyed the ruffed grouse populations within Jo Daviess County. All drumming surveys were conducted from one-half hour before sunrise to approximately 8:30 a.m. The driving census routes consisted of 11 or 12 predetermined listening points about one-half mile apart, along a route approximately 6 miles in length. Walking surveys were 2 or 3 miles long, with listening stops at approximately one-quarter mile intervals. All survey participants were instructed to listen at each stop for a 4 minute time interval.

During April 19-22 a total of 14 driving survey routes and 8 walking survey routes were conducted. The weather conditions were favorable for hearing drumming activities during the entire survey period. The wind was calm and sky clear for nearly all drumming surveys. Six driving routes were run on 2 consecutive days in the ruffed grouse release areas. One walking route was conducted along the Galena River. Two driving surveys were run in the Apple River Canyon Area. And 6 walking routes were conducted in a 1,000 acre sample plot which lies within the grouse release area.

The surveys resulted in the documentation of 4 drumming males. Two birds were located during the driving routes in the grouse release area and investigators located 2 birds in the 1,000 acre plot. The intent of the surveys was to document the existence of grouse and obtain a population trend index in Jo Daviess County. The Galena River routes were established during 1994 to determine if grouse are expanding into new areas. The other new routes in the Apple River Canyon were created to verify the existence of a possible remnant grouse population. Unfortunately, no grouse were located on the newly established routes. To obtain quantitative information on specific grouse population densities, an intensive survey was conducted on a 1,000 acre plot. The intent was to locate all drumming males. A total of 3 drummers were located (2 birds during the 1,000 plot sampling, 1 bird from the driving survey). From this information, the population density was estimated at approximately 1 grouse/100 acres. This estimation is a conservative, minimum spring density of birds of both sexes, which was derived by assuming a 1:1 sex ratio and the existence of non-drumming males. The number of drumming males counted was doubled and expressed as birds/100 acres.

Although the 1994 figure is lower than the previous reporting period (4 drumming grouse - 1994 v.s. 6 drumming grouse - 1993); it is difficult to state that a downward trend exists in the population because of the small sample size and relatively small decrease in drumming males. Due to the short time frame and small area that drumming surveys are conducted, a high probability exists that investigators miss a number of drumming males. The Jo Daviess grouse population requires further study to ascertain a more complete analysis.

Costs: \$7,320.00

Summary:

Ruffed Grouse drumming surveys were conducted on an annual basis in Jo Daviess County, throughout the entire reporting period. In southern Illinois (Union and Pope Counties), census routes were conducted during the entire period with the exception of 1994. During this segment, the southern Illinois drumming surveys were not conducted; because of a lack of manpower and monetary constraints. It was also felt that conducting surveys every other year would be sufficient to assess these grouse populations. The drumming survey information was sufficient to determine the relative status of ruffed grouse on a statewide basis. The drumming survey work indicates that within Illinois, the ruffed grouse populations remain at low densities.

Job VIIIB Evaluation of Potential Grouse Release Sites

Objective: To determine new release sites for grouse by locating and evaluating habitat types with an early forest successional stage composition.

Abstract 1994 Segment:

Habitat analysis for this segment was limited to several field visits and the development of a timber buyers survey. Departmental personnel evaluated several privately owned properties in Jersey and Fulton Counties. Several properties located in Jersey contained desirable habitat conducive for a ruffed grouse release site. The Fulton County areas lacked sufficient early successional stage habitat necessary for grouse management. To assist in locating timber harvest activities a timber buyers survey was drafted. By identifying cut over areas, wildlife biologists can locate potential areas that contain suitable grouse habitat. The survey is currently in a developmental format. Upon completion, the survey will be sent to timber buyers throughout the state.

Costs: \$11,713.00

Summary:

During the reporting period, habitat evaluation centered around Jo Daviess County; because of the ruffed grouse releases which occurred in this area during 1989-1992. Once the releases were completed a greater emphasis was placed upon a statewide perspective. This trend will continue and accelerate, when the implementation of the Illinois Ruffed Grouse Management Plan occurs.

It is recommended that habitat evaluation and identification of potential ruffed grouse release sites continue. The entire process of evaluating ruffed grouse habitat on a statewide basis

is not complete. Future efforts should focus on west-central, northwestern, and southern Illinois, because these regions contain the majority of forested habitat. Potential grouse release sites should be prioritized, based on habitat size, quality, distribution, and current management to facilitate decision-making processes and ensure successful releases.

Job VIIC Coordination of Ruffed Grouse Releases

Objective: To obtain and release ruffed grouse in suitable habitat. This will include renewal and development of agreements with surrounding states to obtain wild-trapped ruffed grouse. Contracts should be developed with other states which are mutually beneficial, such as trade agreements. It will also include all activities related to obtaining and releasing grouse.

Abstract 1994 Segment:

Ruffed grouse releases were not conducted during this segment. Therefore, the provisions of Job VIIC were not utilized.

Costs: \$14,640.00

Summary:

The Jo Daviess County grouse release was completed during this reporting period. A total of 181 grouse were released in this county from 1989-1992. Additional releases are pending upon the completion of a statewide habitat evaluation, which will determine new grouse release sites. When the habitat analysis is complete, renegotiation of trade agreements should follow, to ensure a source of ruffed grouse for future restoration efforts. To assess the possibility of securing grouse for release, a telephone survey was conducted during the summer of 1992. The findings indicated that Minnesota was the only viable option for negotiating a trade agreement. The other surrounding states were not interested in providing ruffed grouse to Illinois.

Job VIID Radio Telemetry Study of Reintroduced Ruffed Grouse
in Illinois

Objective: To evaluate the dispersal, habitat utilization, and productivity of newly-reintroduced ruffed grouse populations.

Cost: \$2,000.00

Summary:

This study was not utilized during the entire reporting period. The main reasons for not accomplishing the objective were lack of personnel availability and materials to conduct the

investigation. The study should be reinstated in the event that a new grouse release is established.

Job VIIE Ruffed Grouse Sighting Card Survey

Objective: To determine productivity, population expansion, and habitat utilization of grouse through the use of sighting card surveys in regions where grouse releases have occurred.

Abstract 1994 Segment:

During the 1994 segment, ruffed grouse sighting cards started being disseminated to the public by Forest Wildlife Project Managers, District Wildlife Biologists, and Private Lands Biologists. This survey is still in the developmental stages and the cards have not been in existence long enough to meet the objective.

Costs: \$2,100.00

Summary:

The sighting card survey was initiated during 1993. The card was designed, sent out for review, accepted, and printed during that segment. Although some cards have been distributed to the public, returns are slow in coming back to the Forest Wildlife Program. The distribution must be modified so that public access to the sighting cards improves. This survey is important because it allows wildlife biologists to evaluate grouse populations throughout the state and the year. This information will assist in developing a comprehensive data base which will enhance the Department's ability to manage ruffed grouse on a statewide basis.

STATE OF ILLINOIS

PROJECT NO.: W-105-R

STUDY IV: Mast Survey

A. Problem:

Mast is a staple source of food of many of Illinois' wildlife species. The quantity and quality of mast in Illinois are subject to the vagaries of local weather conditions particularly in the spring months when the oaks and hickories are subjected to below-freezing temperatures during the flowering stage. Such weather phenomena are sporadic in nature and do not affect the entire state. A system is needed that will enable the Department to monitor mast conditions annually at various localities in the state.

B. Objective:

To annually measure the kind and quantity of mast at various locations in the state.

C. Justification:

It has been demonstrated that the quantity of mast, primarily oaks and hickories is correlated with squirrel production the subsequent year. It is important for wildlife managers to have information annually on the quantity of mast available.

D. Status:

District Wildlife Managers have annually measured mast conditions at some public sites in Illinois since the mid-1970s. Currently mast surveys are conducted on the following sites that are opened to public hunting: Moraine View, Pere Marquette, Big River, Ramsey Lake, Stephen A. Forbes, Sam Parr, Fern Clyffe, Siloam Springs, Randolph County, Kankakee River, Sand Ridge, Spring Lake, Castle Rock and Big Bend (Fig. 1).

E. Procedures:

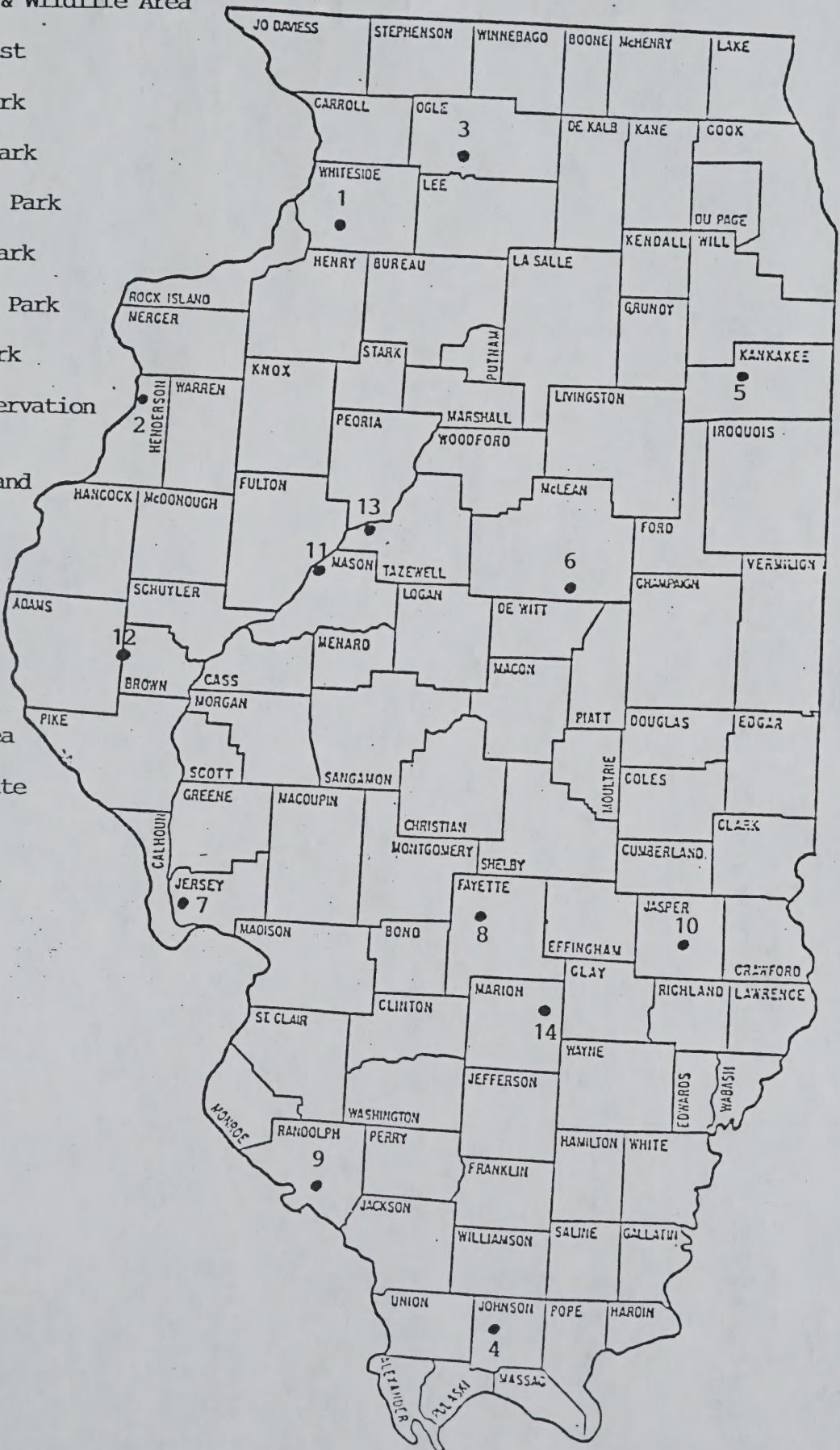
Job VIA Survey of Mast Production

Objective: To measure the annual status of mast available on certain public hunting areas.

From 1989-1991 the study was conducted on select state sites. District Biologists surveyed a variety of mast producing tree species at each site. This information was analyzed by the

MAST SURVEY SITES

- 1) Big Bend State Fish & Wildlife Area
- 2) Big River State Forest
- 3) Castle Rock State Park
- 4) Ferne Clyffe State Park
- 5) Kankakee River State Park
- 6) Moraine View State Park
- 7) Pere Marquette State Park
- 8) Ramsey Lake State Park
- 9) Randolph County Conservation Area
- 10) Sam Parr State Fish and Wildlife Area
- 11) Sand Ridge State Forest
- 12) Siloam Springs State Park
- 13) Spring Lake State Fish & Wildlife Area
- 14) Stephen A. Forbes State Park





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